

NOTICE OF OFFICE OF MANAGEMENT AND BUDGET ACTION

Diana Hynek 05/16/2003
Departmental Paperwork Clearance Officer
Office of the Chief Information Officer
14th and Constitution Ave. NW.
Room 6625
Washington, DC 20230

In accordance with the Paperwork Reduction Act, OMB has taken the following action on your request for approval of a new information collection received on 05/02/2003.

TITLE: Gulf of Mexico Shrimp Economic Data Collection

AGENCY FORM NUMBER(S): None

ACTION : APPROVED WITH CHANGE

OMB NO.: 0648-0476

EXPIRATION DATE: 11/30/2003

BURDEN:	RESPONSES	HOURS	COSTS(\$,000)
Previous	0	0	0
New	120	134	0
Difference	120	134	0
Program Change		134	0
Adjustment		0	0

TERMS OF CLEARANCE:

The survey is approved with changes to question 8.1.

OMB Authorizing Official Title

Donald R. Arbuckle Deputy Administrator, Office of
Information and Regulatory Affairs

PAPERWORK REDUCTION ACT SUBMISSION

Please read the instructions before completing this form. For additional forms or assistance in completing this form, contact your agency's Paperwork Clearance Officer. Send two copies of this form, the collection instrument to be reviewed, the supporting statement, and any additional documentation to: Office of Information and Regulatory Affairs, Office of Management and Budget, Docket Library, Room 10102, 725 17th Street NW, Washington, DC 20503.

1. Agency/Subagency originating request	2. OMB control number b. <input type="checkbox"/> None a. _____ - _____
3. Type of information collection (<i>check one</i>) a. <input type="checkbox"/> New Collection b. <input type="checkbox"/> Revision of a currently approved collection c. <input type="checkbox"/> Extension of a currently approved collection d. <input type="checkbox"/> Reinstatement, without change, of a previously approved collection for which approval has expired e. <input type="checkbox"/> Reinstatement, with change, of a previously approved collection for which approval has expired f. <input type="checkbox"/> Existing collection in use without an OMB control number For b-f, note Item A2 of Supporting Statement instructions	4. Type of review requested (<i>check one</i>) a. <input type="checkbox"/> Regular submission b. <input type="checkbox"/> Emergency - Approval requested by _____ / _____ / _____ c. <input type="checkbox"/> Delegated
	5. Small entities Will this information collection have a significant economic impact on a substantial number of small entities? <input type="checkbox"/> Yes <input type="checkbox"/> No
	6. Requested expiration date a. <input type="checkbox"/> Three years from approval date b. <input type="checkbox"/> Other Specify: _____ / _____
7. Title	
8. Agency form number(s) (<i>if applicable</i>)	
9. Keywords	
10. Abstract	
11. Affected public (<i>Mark primary with "P" and all others that apply with "x"</i>) a. <input type="checkbox"/> Individuals or households d. <input type="checkbox"/> Farms b. <input type="checkbox"/> Business or other for-profit e. <input type="checkbox"/> Federal Government c. <input type="checkbox"/> Not-for-profit institutions f. <input type="checkbox"/> State, Local or Tribal Government	12. Obligation to respond (<i>check one</i>) a. <input type="checkbox"/> Voluntary b. <input type="checkbox"/> Required to obtain or retain benefits c. <input type="checkbox"/> Mandatory
13. Annual recordkeeping and reporting burden a. Number of respondents _____ b. Total annual responses _____ 1. Percentage of these responses collected electronically _____ % c. Total annual hours requested _____ d. Current OMB inventory _____ e. Difference _____ f. Explanation of difference 1. Program change _____ 2. Adjustment _____	14. Annual reporting and recordkeeping cost burden (<i>in thousands of dollars</i>) a. Total annualized capital/startup costs _____ b. Total annual costs (O&M) _____ c. Total annualized cost requested _____ d. Current OMB inventory _____ e. Difference _____ f. Explanation of difference 1. Program change _____ 2. Adjustment _____
15. Purpose of information collection (<i>Mark primary with "P" and all others that apply with "X"</i>) a. <input type="checkbox"/> Application for benefits e. <input type="checkbox"/> Program planning or management b. <input type="checkbox"/> Program evaluation f. <input type="checkbox"/> Research c. <input type="checkbox"/> General purpose statistics g. <input type="checkbox"/> Regulatory or compliance d. <input type="checkbox"/> Audit	16. Frequency of recordkeeping or reporting (<i>check all that apply</i>) a. <input type="checkbox"/> Recordkeeping b. <input type="checkbox"/> Third party disclosure c. <input type="checkbox"/> Reporting 1. <input type="checkbox"/> On occasion 2. <input type="checkbox"/> Weekly 3. <input type="checkbox"/> Monthly 4. <input type="checkbox"/> Quarterly 5. <input type="checkbox"/> Semi-annually 6. <input type="checkbox"/> Annually 7. <input type="checkbox"/> Biennially 8. <input type="checkbox"/> Other (describe) _____
17. Statistical methods Does this information collection employ statistical methods <input type="checkbox"/> Yes <input type="checkbox"/> No	18. Agency Contact (person who can best answer questions regarding the content of this submission) Name: _____ Phone: _____

19. Certification for Paperwork Reduction Act Submissions

On behalf of this Federal Agency, I certify that the collection of information encompassed by this request complies with 5 CFR 1320.9

NOTE: The text of 5 CFR 1320.9, and the related provisions of 5 CFR 1320.8(b)(3), appear at the end of the instructions. *The certification is to be made with reference to those regulatory provisions as set forth in the instructions.*

The following is a summary of the topics, regarding the proposed collection of information, that the certification covers:

- (a) It is necessary for the proper performance of agency functions;
- (b) It avoids unnecessary duplication;
- (c) It reduces burden on small entities;
- (d) It used plain, coherent, and unambiguous terminology that is understandable to respondents;
- (e) Its implementation will be consistent and compatible with current reporting and recordkeeping practices;
- (f) It indicates the retention period for recordkeeping requirements;
- (g) It informs respondents of the information called for under 5 CFR 1320.8(b)(3):
 - (i) Why the information is being collected;
 - (ii) Use of information;
 - (iii) Burden estimate;
 - (iv) Nature of response (voluntary, required for a benefit, mandatory);
 - (v) Nature and extent of confidentiality; and
 - (vi) Need to display currently valid OMB control number;
- (h) It was developed by an office that has planned and allocated resources for the efficient and effective management and use of the information to be collected (see note in Item 19 of instructions);
- (i) It uses effective and efficient statistical survey methodology; and
- (j) It makes appropriate use of information technology.

If you are unable to certify compliance with any of the provisions, identify the item below and explain the reason in Item 18 of the Supporting Statement.

Signature of Senior Official or designee

Date

Agency Certification (signature of Assistant Administrator, Deputy Assistant Administrator, Line Office Chief Information Officer, head of MB staff for L.O.s, or of the Director of a Program or StaffOffice)	
Signature	Date
Signature of NOAA Clearance Officer	
Signature	Date

SUPPORTING STATEMENT
TEXAS OFFSHORE COMMERCIAL SHRIMP FISHERY
ECONOMIC & DEMOGRAPHICS SURVEY FOR THE 2003 SEASON

Introduction

The following is the supporting statement for the Paperwork Reduction Act submission for the approval to collect economic data from commercial shrimp fishing enterprises based in Texas. This submission is to gain approval from the Office of Management and Budget to conduct this data gathering. The proposed data gathering will take place during the year 2003 and will be a continuous data collection program.

A. Justification

1. Explain why you need to conduct the information collection.

A collection of economic and social information from fishermen and fishing businesses affected by the management of federal commercial fisheries on the Gulf coast is needed to ensure that national goals, objectives, and requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MFCMA), National Environmental Policy Act (NEPA), Regulatory Flexibility Act (RFA) and Executive Order 12866 (EO 12866) are met. This information is vital in assessing the economic and social effects of fishery management decisions and regulations on individual fishing enterprises, fishing communities, and the nation as a whole.

Social and economic information on commercial fishing enterprises is vital to the Optimum Yield (OY) management of marine fishery resources as mandated under the MFCMA (16 U.S.C. 1802 M-S Act § 3). The term "Optimum" is defined under section 104-297 (28) of the Act, as: (A) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; (B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factors; and (C) in the case of an over-fished fishery, provides for the rebuilding to a level consistent with producing the maximum sustainable yield in such a fishery.

National Standard Guidelines for social and economic information needs are mandated in 50 CFR 600. Additionally, recent legal decisions ruled against DOC, NOAA, NMFS based on the lack of social and economic information or the inadequate analysis of existing data. Thus, it is imperative that these data be collected to accurately assess the economic and social impacts on individual shrimp fishing entities as imposed by shrimp fishery management plans and regulations. Most important, the fishing industry has been calling for the inclusion of social and economic data in the formation of fishery management plans.

Social and economic data will be collected from shrimp vessel owners who operate offshore and have primarily landed their catch in Texas. During the first year of this study, surveying is being conducted by a NOAA Fisheries contractor using initial face-to-face interviews of vessel owners

(or their designee) who are randomly chosen to participate. It is intended that this after this first year, a review of the success of the survey document will be conducted, any recommended changes or modifications will be made, and the data collection effort will evolve into an on-going annual survey effort. Regular surveying is necessary to capture critical cost and revenue data that fluctuate from year to year. Fluctuations are generally due to annual fluctuations in shrimp abundance caused by environmental factors. Additionally, markets for Gulf shrimp are exhibiting fluctuations as farm-raised and imported shrimp (both wild caught and farm-raised) are becoming more readily available at lower prices. The SERO also anticipates expanding this surveying effort to the other four Gulf states in year 2 (Louisiana, Mississippi, Alabama, and Florida). Separate documentation will be submitted for this expansion.

This study is to be conducted by contract under the auspices of the Economic Fishery Statistics section of the Southeast Regional Office of the NOAA Fisheries. The project was contracted to MRAG Americas, Inc. and was initiated on September 30, 2002. The goal of this project is to collect and update ten-year-old cost and revenue data for this significant fishery.

The NOAA Fisheries currently collects limited information from commercial vessels pertaining to their fishing activities, trip dates, landings, and other information through port agents and mandatory dealer reports. There are no substantial social or economic data collected in these systems other than the value of landings, which is neither consistently complete, nor detailed at the individual vessel level. The information is not comprehensive enough for full economic and social analysis.

2. Explain how, by whom, how frequently, and for what purpose the information will be used. If the information collected will be disseminated to the public or used to support information that will be disseminated to the public, then explain how the collection complies with all applicable Information Quality Guidelines.

The information collected during this study will be used by NOAA Fisheries economists and social scientists to evaluate and modify future ongoing social and economic surveys. The analysis of the sources of variation in costs and revenue during this study will allow future social and economic surveys to be more efficient based on improved stratification and survey designs. Additionally, this first year study will provide an in-depth assessment of the study instrument and interview process.

These data will play an integral role in the social and economic analyses needed for determining the significance of economic impacts on small entities, as required by the Regulatory Flexibility Act and to determine how best to achieve the maximization of net benefits to society, as required by E.O. 12866.

Statistical models that predict or forecast various characteristics such as fleet size, fishing activity or effort, cost versus benefits of fishing, market activity, and efficiencies of proposed fishing regulations will be just a few of the benefits and uses of these data.

It is intended that this become an annual survey (after additional OMB approval), and that it expand to the other four Gulf states, Louisiana, Mississippi, Alabama, and Florida. Gross revenues and costs can vary within a year, and even within or across seasons/trips, as a result of changes in a number of different factors, including fishery management regulations (e.g. gear

modifications, time/area closures, etc.), fluctuations in abundance (due to changes in various environmental factors), and market conditions (such as fuel or seafood prices). Since the last socioeconomic survey was conducted in 1992, there have been great changes in the shrimp fishery with respect to regulations, primary ports of operation, and gear construction, among other factors, yet the social and economic impact of these changes has not been directly assessed. This survey is requesting data for two years, 2000 and 2002. The latter is the most recent year which we can request information, and will provide the current economic status. Additionally, anecdotal information suggests that 2002 was likely one of the worst years for this fishery economically, and this survey will provide the data to verify whether this was the case. Some of the potential causes for the downturn have been attributed to prices falling; increases in insurance premiums following Sept. 11, 2001; and rising fuel costs. Conversely, the year 2000 was one of the best years during the last decade in terms of economic performance. Production levels were high and prices maintained their levels, even with higher production. Thus, comparing data from these two years will help to determine which factors have been most influential in causing erosion in profitability. In the future, annual assessments are needed to account for such impacts, and the causes and sources of overall trends in cost and revenue data.

It is anticipated that the information collected will be disseminated to the public (such as through an annual economic report) or used to support publicly disseminated information. Data may be reported for various groups of fishermen (by vessel size, port, etc.) which will allow vessel owners to compare and evaluate their operations relative to others in the same group in terms of ability to generate revenues, cost efficiency, and profitability.

As will be explained in greater detail in the following paragraphs, the information gathered has utility. NOAA Fisheries will retain control over the information and safeguard it from improper access, modification, and destruction, consistent with NOAA standards for confidentiality, privacy, and electronic information. See response #10 of this Supporting Statement for more information on confidentiality and privacy. The information collection is designed to yield data that meet all applicable information quality guidelines. Prior to dissemination, the information will be subjected to quality control measures and a pre-dissemination review pursuant to Section 515 of Public Law 106-554.

The following is a detailed description of justifications for the collection of these data. Section and question numbers refer to the study instrument.

Justifications for Socioeconomic Survey Questions

The Contractor will provide a copy of the survey instrument to the respondent in advance of the interview. This will allow respondents to compile the necessary information, thereby minimizing bias due to recall error. It is expected to also increase the efficiency of the interview process with respect to administrative time and costs.

Contact Document

A 'Contact Document' was developed to log all contact or attempts at contact by each individual involved in conducting the surveying. It identifies the person to be interviewed as the vessel owner, or his/her designee; corrects any necessary contact information in case there is a need to follow up with respondents; logs the time and date of all contact including the interview time and date; and provides space for any additional comments the vessel owner/designee may wish to share with the Contractor or NOAA Fisheries.

SECTION I. Fishing Operations and Costs

In general, this section of the survey instrument asks questions pertaining to the annual total of variable costs, fixed costs, other annual costs, capital investment in the vessel & equipment, and other variables germane to vessel's technical productivity (e.g. number & size of trawl nets used), business arrangements such as ownership and crew shares, and other production factors. Data resulting from Section I questions are generally necessary to generate cost, profit, input demand, and production functions. Such functions and the results generated from their estimation are typically used in financial analyses (used to determine a business' cost efficiency and profitability), economic impact analyses (used to determine the economic value of a particular activity to a particular locale, community, or region), bioeconomic models (used to predict how the biological and economic components of a fishery will respond to exogenous shocks, such as policy changes), cost-benefit analyses (used, in part, to determine the net economic benefits of a particular action), and behavioral models (such as those that explain or predict exit or entry decisions and decisions regarding spatial or temporal allocation of effort). These data can also be used to determine the relative efficiency of the various participating vessels in a fishery and thus whether the aggregate harvesting costs are in fact being minimized. Such models and analyses are critical to guiding fisheries management decisions whose general purpose is to maximize net national benefits and optimally distribute those benefits.

Part 1, Vessel information

Question 1.1 verifies who is being interviewed, the vessel name, US Coast Guard documented number, total landings, if landings are measured as "head on" or "head off," and total gross revenues for two years. This information will allow NOAA Fisheries to link this vessel information with other pertinent data, such as permit and catch information, located in other datasets. Landings and gross revenues are being requested to provide complete data at the individual vessel level. Although these data are collected by other means, it is not consistently complete or detailed at the individual vessel level.

Question 1.2 asks which port/state the vessel owner considers the base of the vessel's operations. This port may be different than the port(s) where primary landings may occur, but is likely the port where provisioning, maintenance and other cost-related activities occur.

Questions 1.3-1.5 inquire about where fishing activity occurred (in the EEZ or not), how many shrimp fishing trips and fishing days were taken inshore and offshore, and how many days at sea were related to activities other than shrimp fishing. This provides information about the average length of trip and how many days of fishing occurred during a calendar year, and will help to determine which fishermen are full time participants, which are part time, the level of dependency that each has on this fishery, and the potential impacts that regulations may have on them.

Questions 1.6-1.10 attempt to discern the amount of financial capital that has been invested in the vessel and the current value of that capital. This information can be used to estimate various rates of return on the owner's investment. The expected rate of return is a critical factor in the owner's decision to invest further in the vessel, and whether to remain in the fishing industry. Levels of net investment should be indicative of the industry's economic health (i.e. negative net investment indicates an industry in decline). Further, profitable vessels should be associated with higher levels of investment. Similarly, comparisons of the original purchase price and

current market value should also be indicative of trends in the industry's health. The current market value of capital can also be considered an input in the production process.

Questions 1.11 -1.12 collect information pertaining to costs related to vessel haul-outs, hull repair and maintenance. Since vessels may not be hauled out once each year, we ask for the number of years between haul-outs (that is, to fill in "once every (blank) years").

Part 2, Major Mechanical Systems

This question will gather information on the capital investment of the engines, reduction gear, generators, compressors, and chargers used on the vessel, as well as fixed annual costs such as overhauling or replacement costs. Engine characteristics affect how fishermen can and do use their vessels and the related direct costs, such as fuel use, which affects level of production, revenues, and profitability associated with the vessel's operations. In addition, the engine make and model information will be useful in comparing fuel use, overall costs, and other engine characteristics with databases maintained by engine manufacturers.

Part 3, Trawl Gear Information

Questions 3.1 - 3.2. These questions request information regarding the capital investment of the specific trawl gear used, numbers kept on board ready for use, and replacement costs, all of which will differ between individual fishermen, and is not available from alternative data sources. Gear characteristics affect how fishermen can and do use their vessels, and thus the costs, level of production, revenues, and profitability associated with the vessel's operations.

Question 3.3 specifically identifies what type of Bycatch Reduction Devices (BRDs) are in use on the vessel and how frequently. This information will help to assess the socioeconomic impacts of BRD regulations on individual fishing enterprises and fishing communities, and has not been gathered before.

Question 3.4 specifically identifies which type and number of Turtle Excluder Devices (TEDs) are in use on the vessel (if multiple ones are used), and asks for further characteristic details such as size of TED, size and orientation of opening, etc. By region, TED regulations specify minimum sizes and types that can be used, but not maximum sizes. Information about the types of TEDs actually in use will help to assess the socioeconomic impacts of federally-mandated TED regulations on individual fishing enterprises and fishing communities, especially in light of recent changes to the TED regulations. Not only are there direct costs associated with each type of TED, but TEDs, as with BRDs, affects the efficiency of the trawl gear in terms of its ability to catch shrimp, and thereby reduces catch per unit of effort (CPUE) and/or increases the cost per unit effort, resulting in reduced profitability. Information on the relative performance of alternatives TEDs and BRDs will be useful to both managers and fishermen.

Part 4, Electronics

Questions 4.1-4.2. This question will gather information regarding capital investments for all on-board electronics, and replacement costs of those electronics. These questions attempt to discern the amount that has been invested in on-board electronics and expected future investments in on-board electronics. Expected future levels of investment in on-board electronics compared to the past investment in on-board should be indicative of the industry's economic health. Further, profitable vessels may be associated with higher levels of investment in on-board electronics. This is a testable hypothesis. Other research has shown that a certain level of

experience or combination of experience and technology is more important than technology alone. On-board electronics affect how fishermen can and do use their vessels, and thus the costs, level of production, revenues, and profitability associated with the vessel's operations.

Part 5, Annual and Variable Costs

This subsection of the survey instrument asks questions pertaining to annual total of non-labor variable costs (fuel, oil, food), some fixed costs (e.g. insurance, costs of leases adjacent to docks), labor costs (Questions 5.5 and 5.6), and other costs germane to vessel's profitability (e.g. return to investment) and cash flow. These questions can be used to construct input demand function, cost functions, and production functions, all of which are needed to conduct the types of analyses mentioned previously. Data is being requested for both the 2000 and 2002 shrimp season. Anecdotal information suggests that the most recent year for which we can collect data, 2002, was one of the worst for this fishery due to depressed market prices for Gulf shrimp, the high influx of less expensive imported product, increases in insurance premiums following Sept. 11, 2001, and rising fuel costs. Conversely, the year 2000 was one of the best years during the last decade in terms of economic performance. Production levels were high and prices maintained their levels, even with higher production. Thus, comparing data from these two years will help to determine which factors have been most influential in causing erosion in profitability and will help to determine the actual impact that imported product has had on U.S. Gulf shrimp fishermen. In the future, annual assessments (after additional OMB approval) are needed to account for all impacts and the causes and sources of overall trends in cost and revenue data.

Questions 5.1 - 5.4. These questions pertain to the three types of non-labor costs (fuel, oil, and food) associated with the annual number of trips by a given vessel. They are generally related to or a function of the annual level of fishing effort. Fuel costs are a substantial variable cost for trawl fisheries. For fuel, we are also requesting information on the annual average quantity of the fuel purchased and the average price per gallon. Both fuel quantities and prices are requested since total annual costs can change due to a change in quantity purchased *or* the price per unit, and this may affect level of production. These costs may also be influenced by location, since these vessels operate out of multiple states in the Gulf region.

Questions 5.5 - 5.7. These questions are meant to obtain total annual payments to the captain and crew, as well as payroll taxes for the total labor expense. This information will also be used with the information obtained through Question 7.4, which asks about the crew and captain share system. These payments basically represent the flow of annual income to the crew members and captains associated with the vessel. From the captain and crew's perspective, their share of the vessel revenues determines the incomes of their respective households. Changes in annual income received can affect the captain's and crew members' decisions to continue working in this particular fishery, and/or in fishing as a vocation. These data will allow analysts to determine how various factors, such as changes in regulations, may affect the incomes of crew.

Question 5.8 collects information on all types of insurance, related to the vessel, and health benefits. These are fixed costs, that, when incurred, are paid regardless of whether the vessel is used or not, or generates any revenue. These costs are borne entirely by the owner. The lack of hull and other related vessel insurance could be indicative of the industry's economic health. If sufficiently high, vessel owners may chose not to carry full hull or P&I insurance, and thus put their business at risk. Further, health insurance is a type of compensation, and the presence or the lack thereof is a non-economic social aspect of the human environment.

Questions 5.9 - 5.12. These are questions relate to non-labor, annual costs associated with docking or mooring arrangements, utilities while at the dock and miscellaneous hardware (e.g. cables, ropes, etc.). These costs vary across time and vessels and are typically reported on an annual basis.

Questions 5.13 - 5.15. These questions asks for annual costs associated with repair and maintenance of the vessel, gear, and electronics, but excludes replacement costs such as for new trawl doors or nets, since these are covered in Parts 3 and 4 and are part of the capital investment. Question 5.15 are costs that may occur annually and is different than the costs requested in Question 1.11, which are costs that are not typically incurred every year.

Question 5.16 asks for annual depreciation charges and the type of depreciation method used. Depreciation expenses can be calculated in many ways, according to the different accounting methods. These expenses may or may not be relevant depending on the type of analysis being conducted. For example, they may be relevant in determining the net returns to a vessel, but they are not be relevant in a cash-flow analysis.

Questions 5.17-5.23. These questions ask for other costs that are basically fixed, since they do not vary according to the level of fishing activity. These costs are paid regardless of whether the vessel is used or not, or has generated revenue, and are borne entirely by the owner. If sufficiently high, fixed costs can affect the probability of entry and exit into and out of a fishery.

These questions collect information on various federal, state, and local fees (5.17); property tax paid related to this particular fishing vessel (5.18); professional service (i.e. legal, accounting, association dues; 5.19); and vessel management fees (5.20), and vehicle expenses associated with the fishing operation including vehicle repairs, depreciation and fuel (5.23). Questions 5.21 and 5.22 gather information about annual payments on long term, short term, and operating loans. Question 5.21 asks for the combined principal and interest paid, rather than breaking it down. In terms of cash flow and profitability, loan payments, as a fixed cost, can be critical to annual financial performance of the vessel operation. In addition, loan interest rates can be critical component to cross-sectional financial ratio analysis (e.g. interest expense ratio) with a fishery and between fisheries.

Questions 5.24 & 5.25 asks for annual totals of variable costs associated with the cooling and/or freezing of the vessel's catch. For ice, we request information on the quantity purchased, the average price per unit, and the unit in which the input was purchased (blocks, bars or pounds). Ice quantities and prices are requested since total annual costs can be a substantial variable cost in warm-water shrimp trawler fisheries and is dependent upon the level of fishing activity. Likewise, the cost of salt and other freezing supplies for freezer-trawlers is dependent upon the level of fishing activity. Similar to fuel questions, these pieces of information can be used to construct input demand functions, cost functions, and production functions. Furthermore, the use of ice vs. freezing systems, as the predominant method for preserving a trawler's catch, may be associated with vessel size, mobility, duration of trips, and geographical range of a given vessel, each of which affects the vessel's fishing capability. Additionally, shrimp fishermen may convert storage methods between ice and freezers, which are considered more versatile. The large freezers used on shrimp vessels allow shrimp fishing at greater distances from shore, and therefore provides access to deeper-water shrimp species. In contrast, ice storage takes up less

space on board, but requires vessels to stay closer to shore. As with fuel usage/capacity, these data are needed to partition the fleet for economic and management assessments of shrimp fleet harvest capacity and efficiency.

Collection of this information annually is of great benefit, since compilation of a historical database of these parameters will allow for trends to be assessed to individual vessels and the fleet (particularly the ratio of ice vs. freezer vessels) and its harvest capacity.

Questions 5.26 and 5.27. These questions captures any other costs not covered by previous questions.

Part 6, Net Revenues

Questions 6.1 and 6.2. These questions relate to the annual net revenue (fishing related gross revenues minus fishing related costs) associated with shrimp and non-shrimp fishing activities (e.g. charter fishing, etc.) with which a given vessel may be involved. Net revenue is the income flowing to the vessel owner(s) and represents the income related to the owner's overall management (i.e. excluding his skills as a captain) of the vessel operation and related assets. Whether or not the owner's share of the net revenues is sufficient to cover costs and provide a reasonable rate of return on his capital investment and related management skills will affect his decisions to remain in the fishery, switch to another fishery, or exit from fishing altogether. The response will provide the researchers with an understanding of how fishermen estimate costs and revenues compared with how economists estimate it.

Part 7, Vessel Owner, Crew members and Crew Compensation

Question 7.1 requests information regarding the fishing business' form of legal organization and identifies whether the vessel is operated directly by the owner (owner-operator). Economic theory suggests that form of organization can impact who makes decisions within the fishing business, how those decisions are made, and what the goals or objectives of the fishing business might be. Further, form of organization can also impact how efficiently the fishing business operates and the extent to which it can access and obtain capital resources for investment purposes. Form of organization also has repercussions with respect to tax status and legal liability, which can in turn influence the fishing business' behavior.

Question 7.2 asks if the vessel owner owns other fishing vessels, and requests their identification in terms of vessel name and its U.S. Coast Guard or state documentation number. This information is necessary to determine whether a vessel or business is considered "small" by OMB for purposes of the Regulatory Flexibility Act.

Questions 7.3 and 7.4. These questions ask for number of crew members used on an average trip and increases in the number of crew members if larger than normal catches are expected. The number of crew members directly relates to one of the vessel's most important variable costs, labor, and within season changes in crew sizes is germane to estimating vessel profitability and aggregate economic impacts associated with the early stages of season and/or area openings (e.g. opening of the Texas Closure area).

Question 7.5 – 7.9 asks for details on how payments are made to crew, whether the position is paid as a percent share or piecemeal rate (per box), and whether the crew pay part of the variable

trip costs. Based on these percentages, net incomes can be calculated using the data from other sources (landings data) which basically represents the flow of income to the various fishermen associated with the vessel. Specifically, in 7.5 we also request information regarding fishing experience, where the crew member lives, whether the crew member is also a member of the owner's family, and what their remuneration is. The question is in the form of a table to facilitate data recording and entry. We hypothesize that the crew members' particular jobs or functions on the trip (e.g. captain, deckhand, rigger, header) and their relationships to the other crew or the owner will partially affect the size of crew and the share they receive. The presence of payment differentials may serve as an incentive for crew to invest in their own human capital. That is, a beginning header may decide to stay with a particular boat or remain in fishing in general if the opportunity for advancement and higher pay is present. Further, if the crew shares are not equal, the relative impacts of potential regulatory measures will vary across different types of crew members. Familial relationships can affect how the business operates and the degree to which people are tied to each other, the industry, and the communities in which they live. The presence of familial relationships will likely affect a fisherman's willingness to continue in the fishing business. The location where crew members live is germane to estimating and predicting regulatory impacts on fishing communities. Question 7.6 asks for the number of years that the owner has been involved in commercial fishing because it is hypothesized that the owner's experience may be partially linked to the vessel's relative profitability. Question 7.7 asks whether any variable costs (groceries, food and ice) are deducted before shares are allocated, and additional detail on how these costs are split between the vessel owner and crew members (as percentages). This information will be necessary to accurately calculate net income. There is no other data effort that gathers information about the income accruing to individual crew members. Questions 7.8 and 7.9 ask whether any annual bonuses were provided. The basis of the total remuneration can affect the productivity of the crew and boat.

Part 8, Effort Management in the Shrimp Fishery

Questions 8.1 –8.3. This section is unlike the rest of the survey, and is designed to assess the attitude of individual vessel owners toward several types of effort management programs that may be proposed for the Gulf of Mexico shrimp fishery. Information on attitudes is an important part of the social factor analysis. Many of these effort management regimes are new to the entire Gulf Region, thus this section in part will educate the fishermen about their distinction. For Question 8.1, vessel owners will be asked to qualitatively describe their attitude using the terms 'support,' 'neutral,' or 'oppose.' For Questions 8.2 and 8.3, they are asked to qualitatively describe their attitude using the terms 'more likely' and 'less likely.' No other data collection effort exists to assess the shrimp fishery vessel owners of their attitude towards these effort management systems. Attitudes about the industry and its management will likely indicate the fishermen's probability of remaining in the industry under alternative management structures. They will also indicate a fisherman's willingness to comply with newly enacted rules and regulations.

SECTION II: Permit Holder and Crew Member Demographics

The general purpose of this set of questions is to collect data that describes the social and economic nature of fishery participants and their communities (i.e. the human environment or social system). The data can also be used to identify the various social networks to which individual fishermen belong. This information will aid in determinations of whether and to what extent fishermen are dependent on the fisheries in which they participate and to what extent they consider fishing a way of life for them and their families. Social factor analysis can reveal

differential impacts across different regions, communities, and groups of fishermen (in general, different social structures) and thereby help explain their different responses to regulatory changes. Without such information and analysis, it would be impossible to render impact determinations of potential management measures, as is generally done in Social Impact Assessments, Fishery Impact Statements, and Environmental Impact Statements and Environmental Assessments. In general, this data will assist in gauging the social costs and benefits derived from a particular fishery and management thereof, which should be included in any determination of net national benefits.

Part 9, Vessel Owner Information (only)

Questions 9.1 – 9.4. These questions ask for basic demographic information about the vessel owner (or his/her designee) such as age, level of education, marital status, and numbers or persons in their household. Demographic characteristics of the fishery work force is one social factor category necessary to conduct a proper social impact assessment. These characteristics can be used to classify fishermen into groups who are likely to share similar associations (i.e. belong to the same network or system), behaviors, and beliefs or attitudes.

Questions 9.5-9.8. This set of questions will obtain information on the cultural (race) and social structure of the vessel owner and his/her family. These questions are organized as they are currently used and developed by the Census Bureau. Social factor analysis is the analytical tool used when constructing a social impact assessment. Such analysis involves the identification and analysis of social factors (such as religion), its social-cultural and community context, and its participants. Four categories of social factors have been identified by NOAA Fisheries and various academic researchers as being critical to social factor analysis. One of these categories is the cultural issues of attitudes, beliefs, and values of fishermen. Questions 9.5 through 9.6 asks for information about the fishermen's race and primary language of communication. Question 9.5 identifies whether the owner is of Spanish, Hispanic, or Latino ethnicity, and provides additional information regarding the ethnic composition of the "white" race within this population. Anecdotal information suggests that people of this ethnic background play a particular and important role in this fishery, particularly in South Texas communities. Question 9.6 asks specifically about race, as it is asked in the Census. Question 9.7 asks which language is spoken at home. As with demographic characteristics, language may be a factor that bonds or separates various fishermen. That is, these are the initial questions that attempt to obtain information on the social structure of the fishermen, their families, and the communities to which they belong. For example, those who primarily communicate in a particular language are more likely to associate and conduct business with other fishermen who do the same. In general, fishery managers need to know how prevalent language barriers are with their constituency. Lack of communication will result in poor management, or at least perceptions of poor management. Finally, a person's religion is a general reflection of some composite set of attitudes, beliefs, and values. Religion or religious affiliations (Question 9.8) are clearly a potentially defining characteristic of a connected group of people, or what we call a community. A common religion, or set of values and beliefs, is one factor that "connects" people. Anecdotal information suggests that, in communities where fishermen of Vietnamese descent play an important role, their respective religion affects which people, vessels, and businesses they cooperate with and associate. Knowledge of this factor could help us determine what the bounds of a particular community are, geographically speaking, and who belongs to it. We cannot identify fishing dependent communities until we first determine which groups of people constitute a community (fishing or otherwise). Once we identify these communities, and the

social systems in general within which fishermen operate, we should be able to determine how changes in fishery management will affect fishermen's lifestyles, their social and interaction patterns, their choice of where to live, and in general how they will respond. In turn, those responses will have a feedback effect on the structure of the communities and social systems to which they currently belong. These are the types of impacts we are interested in when conducting social impact assessments.

Question 9.9-9.10. These questions are designed to determine the degree to which the vessel owner (or his/her designee) and his/her family are dependent on a particular fishery or the fishing industry in general (i.e. harvest and no-harvest sectors). Dependency is mainly gauged in terms of income dependency. Question 9.9 identifies other occupations that the particular owner is engaged, and the time of year of that work. Not only does this identify other income sources, but from this, researchers may be able to discern if other job opportunities exist for fishermen, if particular fisheries cease to be economically sustainable for all the fishermen currently engaged in it, or if management measures lead to effort limitations. Question 9.10 specifically ask the owner to indicate his/her household income category (categories are based on those currently used and developed by the Census Bureau). This information in conjunction with the net revenue of this vessel (Question 6) will enable the researcher to assess actual financial dependency on the shrimp fishery. This will allow for the distributional impacts of proposed management measures to be discerned (e.g. will a particular measure have similar or differential impacts on fishermen of different means or socioeconomic status).

Parts 10-15, Information About Crew Members (1-6)

In this last section, information will be collected on up to six (6) crew members. It is intended that this section is answered by the vessel owner, and not through an interview with the individual crew members. Due to the basic nature of the questions, many vessel owners will likely be able to answer the questions based on the existing knowledge of their crew. However, in the event that they do not, the vessel owners will be receiving a copy of the full survey document prior to the face-to-face interview, thus providing them with an opportunity to gather the information on their crew in advance.

Most of the individual questions are identical to those described in Part 9, for Vessel Owner Information (only), and have the same justification. Question 10.1 -10.4 asks for the position of the particular crew member, in order to identify that person with their crew share and expected level of income; his/her age; marital status; and level of education.

3. Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological techniques or other forms of information technology.

This study will use face-to-face interviewing techniques administered by contracted individuals who have been trained by a staff person from the NOAA Fisheries, SERO Fisheries Economics Office. Responses to scripted interviews will be recorded on preprinted standardized data forms that will be transmitted to the Contractor's office in Tampa, FL. The surveys responses will be entered into an Access database, designed specifically for this purpose, and data will be periodically transmitted to the SERO Fisheries Economics Office.

The interviewers will not be using laptop computers to enter the interview responses. In the past many of the fishermen in this area have been uncomfortable with the use of computers or tape recorders in interviews. Some of the interviewers are also not proficient at computer use, and with the limited scope of this survey the requisite training probably isn't worth the benefits. The use of laptops will be reviewed for possible use in later surveys in other areas.

There will be no other means, electronic or otherwise, to submit data or information for the purposes of this study. In 2002 outreach effort (described in Section B.3. below) confirmed that the use of personal interviews rather than other surveying methods is preferable when trying to gather the types of social and economic data requested in this survey. Several of the individuals involved in the 2002 outreach efforts are part of the team of interviewers of this survey. All members of the team were chosen due to their long-standing and extensive familiarity with the shrimping industry, including the large Vietnamese component. These interviewers have gained a level of trust from the shrimp fishermen, which is paramount for this efforts success. Electronic means don't contain this personal trust element.

The use of electronic means in future surveys will be considered, with the context of the specific survey and types of respondents dictating the means used.

4. Describe efforts to identify duplication.

There is no duplication of social and economic information gathering on the Gulf of Mexico shrimp fishery. This information will be unique in its detail and specificity to individual fishing entities, their crew, expenses, vessels' ownership, and general operation. These data will be linked to shrimp dealer reports data collected by NOAA Fisheries port agents and the U.S. Coast Guard Vessel Documentation program, and the draft survey document went through several reviews to insure that there was no duplication. Specific social and economic information to be gathered is discussed in Section 2, and is in the draft survey instrument as presented in Attachment 3.

5. If the collection of information involves small businesses or other small entities, describe the methods used to minimize burden.

It is unknown whether all entities in the Gulf shrimp fishery are considered small businesses. There is some anecdotal evidence to suggest that there may be some 'large' entities in the fishery. Therefore, separate requirements based on size of business have not been developed. Only the minimum data to meet the current and future needs of NOAA Fisheries management, stock assessments, and permitting programs are requested from all applicants. The results of this study are expected to improve the economic conditions of small fishing entities by affording fishery management agencies the information needed to consider social and economic factors in management plans and regulations.

6. Describe the consequences to the Federal program or policy activities if the collection is not conducted or is conducted less frequently.

Socioeconomic data was last collected by NOAA Fisheries for this fishery in 1992, over a decade ago. At that time, the data collection was a one-time survey that only obtained information for a portion of the offshore fleet based in Texas. Other previous attempts to collect

costs and returns data have been similarly plagued by their small scope and/or their limited duration. Current economic and social data is needed for the Gulf shrimp fishery as a whole in order to accurately assess the positive and/or negative impacts of federal rules and regulations. Such assessments are mandated under Executive Order 12866, the Regulatory Flexibility Act, Magnuson-Stevens/Sustainable Fisheries Acts (and the National Standards attached thereto), and the Endangered Species Act, among others. Additionally, recent legal decisions against the federal government have been handed down based on the absence of social and economic data (i.e. summer flounder litigation: North Carolina Fisheries Association, et al. versus Daley - Civil Nos. 2: 97cv339; 2: 98cv606).

According to the Small Business Administration, fluctuations in short-term profitability are important in determining whether or not small businesses are forced to exit an industry. According to various lawsuits involving the shrimp industry and NMFS, industry has severely criticized the accuracy of previous social and economic analyses related to particular Council and NMFS actions. If current and accurate socioeconomic data are not available, then the social and economic assessments of management alternatives will likewise be inaccurate, thereby potentially leading the Council and NMFS to make poor management decisions. Thus, continuous data collection of cost and earnings data are needed to satisfy these various mandates and help ensure that good management decisions are made.

7. Explain any special circumstances that require the collection to be conducted in a manner inconsistent with OMB guidelines.

The collection is consistent with OMB guidelines.

8. Provide a copy of the PRA Federal Register notice that solicited public comments on the information collection prior to this submission. Summarize the public comments received in response to that notice and describe the actions taken by the agency in response to those comments. Describe the efforts to consult with persons outside the agency to obtain their views on the availability of data, frequency of collection, the clarity of instructions and recordkeeping, disclosure, or reporting format (if any), and on the data elements to be recorded, disclosed, or reported.

A copy of the Federal Register notice is attached. The Notice was published on December 6, 2002, and the public comment period closed on February 6, 2003. No public comments were received in response to this notice.

Efforts have been made to consult with persons outside the agency to obtain their views on availability of data, frequency of collection, the clarity of instructions and recordkeeping, disclosure, or reporting format (if any), and on the data elements to be recorded, disclosed, or reported. The Contractor assembled a team of experts with experience in survey design and the Gulf shrimp industry to facilitate development of this new, comprehensive survey, and to incorporate a wide review of the draft document.

NOAA Fisheries has documented that the data to be obtained through this survey is not currently available, and this is discussed in response to sections 2 and 6 above.

The team of trained interviewers who will be conducting the survey includes individuals who work directly with the shrimp industry in Texas. A pretest with the draft survey was completed in February 2003 with seven individual vessel owners, and particular questions were clarified, rephrased, reorganized, and in some questions removed, based on the result of the pretest and other reviews.

It is the intent that this survey be carried out annually (after additional OMB approval), from this point forward, because of the paucity of existing costs and revenue data in the shrimp fishery; the fact that there can be wide fluctuations in all costs, not just variable, as well as revenue and profits costs from year to year, based upon forecasts about the shrimp stocks, market conditions in the U.S. and abroad, and current management regulations; and the future, proposed management strategies are substantially different from the current management structure. The Council and NOAA Fisheries will be requiring accurate cost and earnings data to satisfy the various mandates described in section 6, fully assess the social and economic impacts of potential management structures, and help ensure that good management decisions are made.

9. Explain any decisions to provide payments or gifts to respondents, other than remuneration of contractors or grantees.

No monetary payments of other remuneration will be made to individuals that are interviewed.

10. Describe any assurance of confidentiality provided to respondents and the basis for assurance in statute, regulation, or agency policy.

All data that are submitted are treated as confidential in accordance with NOAA Administrative Order 216-100.

11. Provide additional justification for any questions of a sensitive nature, such as sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private.

Questions of a sensitive nature will be asked of all survey participants. These questions include, but are not limited to, the respondent's financial earnings from fishing activities, business expenses, relationships among members of the crew and certain demographic characteristics (see survey instrument in Attachment 3). The questions are necessary for the development of social and economic assessment models. In-depth justifications for individual survey questions were provided above in section 2.

12. Provide an estimate in hours of the burden of the collection of information.

In the first year, the sample size for completed surveys is approximately 120 individual vessels or 10% of the approximate total number of shrimp vessels that land shrimp in Texas. The public reporting burden for the face-to-face interviews is estimated at an average of one hour and seven minutes per interview: 15 minutes for preparation, 19 minutes for annual/fixed cost and capital investment questions (Sections 1-4), 20 minutes for annual and variable cost and price questions (Sections 5-7); 5 minutes for effort management (Section 8), and 8 minutes for socio-demographic questions (Sections 9-14, as necessary). The breakdown of estimated time per response is slightly different than that advertised in the Federal Register Notice. This is due in

large part to changes in the interview methodology and a reorganization of the survey instrument, based on pre-test results, as well as industry input.

Interviewers will be contacting the individual participants to introduce themselves and schedule the face-to-face interviews at a time convenient to the vessel owner (or his/her designee). It is estimated that an average of 15 minutes will be needed by the respondent to review business records prior to the start of the interview. The estimated average time necessary to conduct a complete interview is 52 minutes. Thus, there will be an estimated total annual burden hours of 134 hours.

13. Provide an estimate of the total annual cost burden to the respondents or record-keepers resulting from the collection (excluding the value of the burden hours in #12 above).

There will be no financial cost to the public to participate in this study. Information to be gathered in this study should be readily available in the vessel financial statements, recalled from the respondents' memory, or found in federal tax returns.

14. Provide estimates of annualized cost to the Federal government.

The proposed budget for the contract to conduct this work in FY 2003 is \$95,388. This includes development of the survey design, development and pre-testing of the survey instrument, conduct of the survey, database development, data entry, preparation of all reports, and all associated travel.

The estimate of annual costs for NOAA Fisheries staff involvement is \$14,000, comprised of \$12,000 in staff time (and benefits) and \$2,000 in travel costs.

15. Explain the reasons for any program changes or adjustments reported in Items 13 or 14 of the OMB 83-I.

There are currently no federal social and economic data efforts that are gathering information on costs and revenues to the Gulf shrimp fishery. Only value of landings is collected by port agents or through dealer reports, but it is not consistently complete, not detailed at the individual vessel level, and not comprehensive enough for full economic and social analysis.

This is a new survey effort, therefore all the burden hours and costs identified above will be applied to this program change.

16. For collections whose results will be published, outline the plans for tabulation and publication.

These data will be published in summarized format and generalized tables in an annual NOAA Fisheries economic report. A final project report will provide documentation about the survey methodologies, survey instrument, statistical and random sampling design, and an assessment of the validity of the collected data.

17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons why display would be inappropriate.

The OMB approval number and expiration date will appear on the first page of the interview form (see Attachment 3) that is mailed to individual participants. Additionally, the respondents will be briefed before the study actually begins and they will receive printed information concerning the study. The printed information will include the OMB approval number, expiration date as well as other important information to facilitate their interviews and compliance with applicable laws.

18. Explain each exception to the certification statement identified in Item 19 of the OMB 83-I.

There are no exceptions to the certification statement identified in Item 19 of the OMB 83-J.

B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS

Please see the attached documents (Attachment 4) that contains two reports that document and describe in great detail the statistical methodology to be used, and their justification.

1. Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection method to be used. Data on the number of entities (e.g. establishments, State and local governmental units, households, or persons) in the universe and the corresponding sample are to be provided in tabular form. The tabulation must also include expected response rates for the collection as a whole. If the collection has been conducted before, provide the actual response rate achieved.

The potential respondent universe is 1,207 vessels that predominantly land shrimp in the state of Texas. The survey will consist of 10% of the total population (approximately 120 vessels). The collection has not been conducted before.

Estimated response rate is 60%, similar to other socioeconomic surveys and due to the methods being employed to maximize response rates for this project, as described under the response to B3, below. The sampling protocol design deals with adjusts for nonresponse through the use of sequential sampling methods. These methods are described in great detail in the second report attached.

2. Describe the procedures for the collection, including: the statistical methodology for stratification and sample selection; the estimation procedure; the degree of accuracy needed for the purpose described in the justification; any unusual problems requiring specialized sampling procedures; and any use of periodic (less frequent than annual) data collection cycles to reduce burden.

The first report attached details a sampling and estimation strategy that may be used to provide both point and interval estimates of fleet-wide total and average values for responses of interest in the planned survey. It is strongly believed that some stratification of the population of shrimp

fishing vessels should be used to ensure coverage of various sectors that may exist in the fleet and possibly improve efficiency (i.e. reduce variances) of the resulting estimators of the population values. The basic to be used is that of post-stratification, but this is combined with a highly stratified initial sample designed to provide coverage of all sectors of the fleet relative to geographic location of primary port (12 ports), size of vessel (two based on tonnage), and activity in 2001 (two economic return categories, above and below average for the given total landings), for a total of 48 sampling strata.

Full detail is provided in the attachment.

3. Describe the methods used to maximize response rates and to deal with nonresponse. The accuracy and reliability of the information collected must be shown to be adequate for the intended uses. For collections based on sampling, a special justification must be provided if they will not yield "reliable" data that can be generalized to the universe studied.

Several methods have been/will be in use to maximize response rates for this project. First, under contract to NOAA Fisheries, the Gulf and South Atlantic Fisheries Foundation conducted an extensive outreach and education program for Gulf shrimp fishermen regarding the collection of socioeconomic data in 2002. The outreach techniques used included small luncheon meetings, formal workshop environments, and one-on-one/ small group contacts on the waterfront. Approximately 136 individual members of the shrimping industry Gulf-wide were contacted, and since many of the contacts were with fleet owners, as well as individuals or companies that manage and/or buy product from multiple vessels, over 400 vessels were involved. The overall purpose of this effort was to begin to educate the Gulf shrimping industry of the significance of this new annual social and economic surveying effort, and the importance of their cooperation to its success.

Secondly, the success of the 2002 outreach effort has confirmed that the use of personal interviews rather than other surveying methods is preferable when trying to gather the types of social and economic data requested in this survey. Several of the individuals involved in the 2002 outreach efforts are part of the team of interviewers of this survey. All members of the team were chosen due to their long-standing and extensive familiarity with the shrimping industry, including the large Vietnamese component. These interviewers have gained a level of trust from the shrimp fishermen, which is paramount for this efforts success.

Third, outreach activities are currently underway as a follow-up to the personal contacts made last year, and as a way to prepare members of the Texas shrimp fishing community for the initial contact by mail and telephone. Members of the project team participated in a well-attended Gulf Shrimp Symposium, put on by Texas Sea Grant in March, and distributed fliers announcing the survey effort. Further efforts will include articles in industry publications, posting information in industry and NOAA websites, and participation at other industry events.

Finally, creation of annual economic reports, which has been lacking for this industry is expected to encourage participation by individual fishermen. It is anticipated that data will be reported for various groups of fishermen (by vessel size, port, etc.) which will allow vessel owners to compare and evaluate their operations relative to others in the same group in terms of ability to generate revenues, cost efficiency, and profitability.

4. Describe any tests of procedures or methods to be undertaken. Tests are encouraged as effective means to refine collections, but if ten or more test respondents are involved OMB must give prior approval.

Part 3 of this survey, which asks for details about trawl gear used and owned, was developed and tested during the outreach activities in 2002, described above in #3. Nine volunteer industry participants, as prescribed by OMB guidelines, were selected to fill out the draft form for pre-testing purposes, and their feedback has helped to shape the existing survey design.

A pretest with the entire draft survey was completed in February 2003 by two of the interviewers with seven individual vessel owners, and particular questions were clarified, rephrased, reorganized, and in some questions removed, based on the result of the pretest and other reviews. The cooperating permit holders were selected for interview and survey analysis because of variation that existed in their shrimp operations, ethnicity, and/or fishing practices. Results from the pretest were written up, and modifications were made to the draft instrument. Additionally, Interviewer notes were added to add clarification on particular survey questions that might have appeared confusing.

After modifications were made to the draft survey, a training was held for all interviewers to review each question, prepare for actual interviews, and to benefit from a review of the pretests that had occurred.

5. Provide the name and telephone number of individuals consulted on the statistical aspects of the design, and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.

Dr. Mark Kaiser of the Department of Statistics at Iowa State University was consulted on the statistical aspects of the sampling design. In addition to review by Dr. Michael Travis, NOAA Fisheries Economist, his work was reviewed by Marcus Hartley and Patrick Burden of Northern Economics Inc, and Raymond Rhodes, Independent Fisheries Economist, members of the project team. These team members, with the addition of Dr. Walter Keithly, Louisiana State University, will assist with assessing the success of the survey effort and any potential biases that may have occurred.

MRAG Americas, Inc. is the contractor for this survey effort. They have subcontracted four individuals based in Texas who will conduct the surveys and collect the social and economic data. These individuals are: Gary Graham, Tony Reisinger, Russell O'Brien and Toan Tran. All have direct experience working with the Texas shrimp industry as either Sea Grant Extension Agents or observers on Gulf shrimp vessels.

Analysis of the information gathered will be conducted by staff at NOAA Fisheries. However development of the database to manage the data collected and allow it to be linked with other NOAA Fisheries databases is being handled by MRAG Americas.

Contact details for Dr. Kaiser and Heidi Lovett, Project Manager at MRAG Americas are:

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**Program to Collect Socioeconomic Data from
Offshore Gulf Shrimp Fishermen
in Florida, Alabama, and Mississippi**

Statement of Work

PURPOSE AND NEED

The last year in which the National Marine Fisheries Service (NMFS) collected costs and returns data for the Gulf shrimp fishery *was* 1992. In that case, the data collection was a one time survey that only obtained for a portion of the offshore fleet based in Texas. Other previous attempts to collect costs and returns data have been similarly plagued by their small scope and/or their limited duration. Current economic and social data is needed for the Gulf shrimp fishery as a whole in order to accurately assess the positive and/or negative impacts of federal rules and regulations. Such assessments are mandated under Executive Order 12866, the Regulatory Flexibility Act, Magnuson-Stevens/Sustainable Fisheries Acts (and the National Standards attached thereto), and the Endangered Species Act, among others. According to the Small Business Administration, fluctuations in short term profitability are important in determining whether or not small businesses are forced to exit an industry. According to various lawsuits involving the shrimp industry and NMFS, industry has severely criticized the accuracy of previous social and economic analyses related to particular Council and NMFS actions. If current and accurate socioeconomic data is not available, then the social and economic assessments of management alternatives will likewise be inaccurate, thereby potentially leading the Council and NMFS to make poor management decisions. Thus, continuous data collection of cost and earnings data is needed to satisfy these various mandates and help ensure that good management decisions are made.

Gross revenues and costs can vary within a year, and even within or across seasons/trips, as a result of changes in a number of different factors, including fishery management regulations (e.g. gear modifications, time/area closures, etc.), fluctuations in abundance (due to changes in various environmental factors), and market conditions (such as fuel or seafood prices). In the latter case, such fluctuations may be completely due to factors outside the domestic industry (e.g. downturns in macroeconomic conditions, increases in imports, changes in other countries' fuel production policies, etc.).

**PROGRAM DESIGN FOR IMPLEMENTATION OF
AN ONGOING DATA COLLECTION PROGRAM**

At this time, neither federal logbooks nor universal state trip tickets across all Gulf states presently exist. Implementation of a federal shrimp permit requirement is expected in 2002, but is not yet in place. NMFS does collect landings and price data via a Gulf-wide shrimp dealer reporting program. However, only Coast Guard registered vessels (fishing craft >5 net tons) are identified in this database. That is, landings/trips of state registered boats are consolidated, thereby suppressing identification of such boats. These boats primarily operate in inshore areas, which confounds present attempts to profile the inshore component of the fishery. However, the Coast Guard registered vessels typically operate in offshore waters, and their inshore activities are usually individually identified. At this time, the current status of federal shrimp data in the Gulf necessitate a focus on offshore, Coast Guard registered vessels for any socioeconomic data collection program. As the data becomes more comprehensive in its coverage of individual fishing

craft activities, so will the socioeconomic data collection program.

The NMFS shrimp dealer database, in combination with information from the Coast Guard database, will serve as primary source of information for developing a sample design for the socioeconomic data collection program. Due to the previously noted problems, and fluctuations in participation from one year to the next, the size of the offshore shrimp trawl fleet is not known with exactness. Further, many vessels are migratory in nature. That is, as seasonal abundance changes throughout the year for the primary species (brown, white, and pink shrimp), many vessels will move in response to those changes, while others remain “close to home.” But even migratory vessels have a primary port or “home base” from which they typically operate.

The purpose of this particular project is to initiate a socioeconomic data collection program for vessels that are based in or primarily operate out of ports in Florida, Alabama, or Mississippi. Programs for the other Gulf states will be implemented separately but simultaneously. While consistency is desirable across the different states, and will be ensured to the maximum extent possible (e.g. via use of the same survey instrument, similar sampling designs, etc.), it is quite possible that a potential contractor will be better suited to implement the program in one state as opposed to another due to previous survey or research experience and/or first-hand knowledge of that states’ shrimp fishermen and industry. Variations in sample design may also be necessary due to the specific nature of the vessels/fisheries in each state/region. The potential use of multiple contractors will also allow for a comparative evaluation of their relative success in properly implementing this program, and thus who is best suited to operate the program in the long-term. Experience gained from the first year may in fact indicate that an external contractor cannot successfully operate such an ongoing program.

There are a number of ways to collect cost and earnings data on a continuous basis. However, research has shown that, in general, in-person interviews are more successful in collecting high quality data compared to phone or mail interviews. The case for in-person interviews is particularly strong when a new data collection program is being implemented. In-person interviews allow for direct, face to face dialogue, which provides the interviewer and person being interviewed a much better opportunity for clear and consistent communication, not only within an interview but across interviews. Such dialogue not only enhances understanding and comprehension, but also is likely to lead to improvements in program design and the building of rapport with industry participants over time. The in-person approach has also been shown to have a strong positive effect on response rates. The latter effect is particularly important in the case of a voluntary data collection, which this program is structured to be at this time. After the program’s first year, the possibility exists for interviews to be done via the phone, if the industry participants deem such an approach acceptable. While the phone interview method would likely reduce program costs, acceptability by industry must be ensured in order to maintain the necessary level of participation. Regarding industry’s perspective, the contractor will be responsible for reading and taking into account a report that details the results of an outreach and education program conducted with the offshore Gulf shrimp fishermen from January-April 2002 regarding implementation of a socioeconomic data collection program (Gulf and South Atlantic Fisheries Foundation, June 2002). The NMFS economist who cooperatively worked on that project will provide a copy of the report to the contractor.

Currently available data suggests that approximately 520, 250, and 380 (1180) offshore vessels are based in or primarily operating out of Florida, Alabama, or Mississippi ports respectively. Based on previous surveys, and given the need to balance coverage with cost, a sampling rate of 10% should ensure adequate and representative coverage of the fleet. Thus, a minimum of 120 vessels will be included in the first year of the Florida, Alabama, and

Mississippi program. The appropriate NMFS economist will provide the contractor with the universe of identified vessels. The contractor will work with the NMFS economist to develop the final stratified and random sample design. Potential strata could include port/county, vessel size, or level of landings/value, among others. After completion of such, the contractor will select the final sample. In selecting the sample, the contractor must take into account the possibility of non-response. That is, the sample size of 120 vessels represents the necessary number of respondents. Since non-response is possible, the selected sample will need to be larger than 120 vessels. Further, the contractor must develop a means by which to test for the presence of survey response bias. On the other hand, if non-selected vessel owners wish to participate in the program, such participation will be allowed in order to enhance coverage, provide additional data for comparison purposes, and promote industry cooperation with the program.

The survey instrument will be fielded once each calendar year. Due to the highly seasonal nature of the fishery, noting that this varies somewhat across different areas of the Gulf, specific times of the year are optimal for conducting interviews. In Florida, Alabama, and Mississippi, this time period is generally from January through April, with earlier dates during that period being preferable in Mississippi/Alabama and later dates preferable in Florida. Due to the sometimes highly specific nature of the data being collected, a copy of the survey instrument will be provided to all participants in advance so that vessel owners/operators can compile the necessary information and provide accurate responses. The contractor will work with the NMFS economist and other potential contractors to develop the survey instrument. The contractor will pre-test the survey instrument prior to implementation. As per OMB guidelines, the number of pre-test interviews is limited to nine. The information obtained via the pre-tests will be included in the Paperwork Reduction Act (PRA) package, which the contractor will be responsible for compiling in order to obtain OMB approval of the data collection program. OMB approval typically requires a time period of 4-6 months. Among other items, this package will include the sampling design and survey instrument. While details of the instrument will be worked out in the initial phase of the contract period, it must include the following general set of data elements:

1) variable costs, 2) fixed costs, 3) other annual costs, 4) capital investment in the vessel, gear and electronics, and 5) socio-demographic information.

With respect to variable costs, information on the following should be included: 1) average input prices (e.g. price of diesel and/or gasoline per gallon, price of ice per block, etc.), 2) input quantities (e.g. quantity of fuel used, quantity of ice used, etc.), and 3) total annual cost for each input (fuel, ice, oil/grease/hydraulic fluid, groceries, salt, etc.). Other variable costs might include refrigeration, handling, and storage expenses as well as fees associated with offloading, transporting, selling, and/or processing of shrimp. In the case of fees, it may be important to know the basis for such charges (e.g. are they based on weight, value, etc.). The share breakdown between the boat, captain, and crew must also be determined.¹ This information could be reported in percentage terms, number of shares, or in dollar terms. The share data is necessary to measure labor costs and thus total variable costs.

Examples of fixed/annual cost data to be collected would include: repair and maintenance expenses (gear, electronics, and vessel, including drydock), vessel dockage/rent/utility expenses, insurance expenses (hull, P and I, medical), expenditures on fishing licenses and permits, loan payments on the vessel, business taxes related to the vessel, office expenses (accounting, legal

¹ As with other vessel characteristics, number of crew and whether the vessel is owner or hired captain operated should already be known from other data sources.

costs, etc.), costs associated with vehicles related to the vessel's operations, and any other vessel related expenditures (travel expenses, relocation expenses, etc.). Fixed/annual and variable costs will generate total operating costs and thus, in combination with information on gross revenues, lead to the calculation of net revenues and profit rates or margins.

In the case of capital investment, questions would include the vessel's initial purchase as well the cost of subsequent purchases of new/additional gear, electronics, and capital (i.e. improvements in the gear, fishing technology, and the vessel). Such information can be used to calculate rates of return to investment.

With respect to socio-demographic information, data to be collected would include questions regarding: level of fishing experience, age, education level, marital status, ethnicity/race, health status, primary language, religion, living arrangements (e.g. rent or own home), community affiliation, affiliation with fishing organizations, household income and size, and reliance on the shrimp fishery and commercial fishing in general. Such information should be collected for the owner and captain. Thus, if a vessel is operated by a hired-captain, both individuals should be asked to answer this set of questions. This information is needed, not only for descriptive purposes, but also to discern whether certain groups or types of fishermen and their respective households will be differentially impacted by alternative management measures.

Information regarding the vessels' annual gross revenues (landings and prices by size category) from shrimp activities will be available from the NMFS shrimp dealer landings file. Though many offshore shrimp trawlers operate in the fishery on a full-time basis, some do not. Information on gross revenues from non-shrimp fisheries is available via other databases. However, since concerns exist over the accuracy and comprehensiveness of this data, such data will be compiled in advance and subsequently verified (or corrected if necessary) during the interviews. Such information is not only important in estimating profitability, but the vessels' dependence on revenues from the shrimp fishery.

PROJECT TASKS

Activities associated with the following tasks are expected to commence in September, 2002 and be completed by August, 2003.

Task I

A strong preference exists for contractors/interviewers who are experienced in fielding socioeconomic surveys, particularly with commercial fishermen. If the contractor(s) is/are not the actual interviewer(s), then the contractor shall hire, train and supervise personable and qualified interviewers. The NMFS economists will participate in such training. The contractor and its employees will read and take into account all information contained in the Gulf and South Atlantic Fisheries Foundation's report on the outreach and education program. The ultimate success of the survey depends on the ability of interviewers to establish rapport with fishermen, to clearly explain the intent of each question, and to understand the answers given by fishermen. Interviewers should be knowledgeable about the fishery and fishing techniques prior to conducting the interviews.

Task II

The contractor will work with the NMFS economist to develop the final stratified and random sample design. Potential strata could include port/county, vessel size, or level of landings/value, among others. After completion of such, the contractor will select the final sample from a universe of vessels provided by the NMFS economist. In selecting the sample,

the contractor must take into account the possibility of non-response. That is, since the number of necessary respondent vessels is 120, the selected sample will need to be larger than 120 vessels. Further, the contractor must develop a means by which to test for the presence of survey response bias. The NMFS economist will notify the contractor of non-selected vessel owners who wish to participate in the program. The contractor will allow for such participation.

Task III

The contractor shall work with the NMFS economist to draft the survey instrument. After such development, the contractor shall pre-test the draft survey instrument to ensure that all questions are easily understood. Based on the results of the pretest, the contractor shall revise the questionnaire to improve its wording, organization, and content. Knowledge and experience with models, techniques and data required to perform economic analyses of regulatory alternatives are required to make useful revisions to the draft questionnaire. The NMFS economist will have final approval of the final instrument, subject to OMB's approval. The final version of the questionnaire should be designed to facilitate data entry into computer files.

The Office of Management and Budget (OMB) must approve the final survey instrument. The contractor will prepare the supporting documents necessary to obtain OMB clearance for the survey. Implementation of the program must await final OMB approval. Full payment under Task I and Task II is contingent on receiving OMB approval. The survey instrument must include the following general set of data elements: 1) variable costs, 2) fixed costs, 3) other annual costs, 4) capital investment in the vessel, gear and electronics, and 5) socio-demographic information. Subject to OMB approval, the NMFS economist has final approval over the survey instrument, its content, and structure.

Task IV

The contractor shall contact vessel owners and operators, schedule interviews, and then use the OMB approved survey instrument (Task III) to conduct personal interviews with offshore shrimp fishermen in Florida, Alabama, and Mississippi to collect the desired information. Names and contact information for all potential participants will be provided to the contractor. Interviewers will contact and screen fishermen and schedule interviews at times and places convenient for fishermen. Interviews should be scheduled to minimize potential conflicts with normal business operations. For Florida, Alabama, and Mississippi offshore vessels, the months of January through April are optimal, with earlier dates during that period being preferable in Mississippi/Alabama and later dates preferable in Florida.

The contractor shall work with the NMFS economist to ensure the best possible participation in the survey by clearly stating the goals of the study, by publicizing the survey, by using personable and qualified interviewers, and by enlisting the cooperation and assistance of local fish dealers, fishermen's associations and marine extension specialists in each area. The contractor will compile the information on shrimp and non-shrimp gross revenues and record such on the survey instrument for each vessel. The contractor will then provide a copy of this instrument to the participating fishermen in advance of the interview. This will allow respondents to compile the necessary information, thereby minimizing bias due to recall error and allowing for verification of the gross revenue data.

All data to be collected are considered confidential and shall be handled in accordance with NOAA Administrative Order 216-100, Confidential Fishery Statistics. The Order will be

furnished to the contractor. Respondents shall be assured that only group averages or group totals will be presented in any reports, publications, or oral presentations of the study's results.² Participation in the program is voluntary. However, it is important for interviewers to stress that, since the program only covers a sample rather than a census of vessels, refusal to participate could introduce a bias into the data set.

Task V

The contractor shall enter the data into computer files that can be read and manipulated by the NMFS economist using IBM-compatible personal computers. It is preferred that the data be coded in Dbase, Excel, SAS, or SYSTAT/SPSS format, although other formats are permissible provided that the NMFS economist has access to software capable of reading the data. The contractor will develop appropriate quality assurance/quality control procedures for proper and expeditious editing/proofing of the survey data.

Task VI

The contractor will provide progress reports after each three (3) month time period, beginning on the effective date of this contract. Two copies of the progress report shall be provided advising as to work done during the period, work forecasted for the following period, names, title, and number of man-hours of each of the Contractor's professional personnel assigned to the contract, including officials of the Contractor, and such additional information, findings and recommendations as may assist the NMFS economist in evaluating progress under this contract. The first progress report shall include the detailed work outline of the study and the Contractor's planned phasing of his work by reporting period.

Ten months after the effective data of this contract, the contractor shall prepare a draft final report that describes any training that took place (Task I), the stratified, random sampling design (Task II), pretest results (Task III), and interview (Task IV) procedures and submit the draft to the COTR. The rationale behind any changes to the draft survey questionnaire (Task III) should be described. Problems that were encountered during the interview phase and the resulting solutions should be documented. The database file structure, variable formats and definitions of variable codes (Task V) should be described. A draft of the survey database shall be included with the draft report for review purposes. Recommended changes in the data collection program's design should also be presented and discussed. A recapitulation of man-hours expended by each of the Contractor's professional employees, including officials of the Contractor, and a brief summary of the report including shod statements regarding the program's objectives, scope, methodology, information obtained, and conclusions. The NMFS economist will review the draft and return it to the Contractor within thirty (30) days after receipt with comments and instructions for a format to be used in the preparation of a final report. The contractor shall also provide a revised final report to the COTR no later than two (2) months after the COTR approves the draft.

INVOICING

The Contractor shall submit a detailed invoice with supporting documentation at the first of each calendar month, for the prior months work, to the technical representative along with the progress

² "Group" in this case refers to at least three (5) vessels or business entities.

report as detailed in the next section. The technical representative will review the invoice for accuracy before certifying the invoice and forwarding to the Finance office for payment. Payments will be made on a monthly basis for work completed. Total payments are not to exceed the total cost of the contract.

PROGRESS REPORTS

The Contractor shall submit brief quarterly reports that describe specific activities and research accomplishments for the previous period. The report will include discussion of progress toward pre-specified product goals, problems encountered, resolution steps, expectations of subsequent progress, and recommendations for procedural modifications where appropriate.

DELIVERABLES

The contractor shall deliver the final report, the computer files, and completed questionnaires to the NMFS economist. All data compiled and collected under the program shall be edited and proofed prior to final delivery via CD-ROM to the NMFS economist.

PERIOD OF PERFORMANCE

The period of performance is not more than 12 months from the award date of the contract.

CRITERIA FOR EVALUATION

1. First-hand knowledge of and experience in developing and fielding socioeconomic surveys. (25%)
2. First-hand knowledge of and experience in working with the commercial fishing industry, particularly the Gulf shrimp fishery. (25%)
3. Knowledge of sampling theory/design, descriptive, and inferential statistics. (20%)
4. Experience in conducting socioeconomic research on the Gulf shrimp fishery. (15%)
5. Experience in design, development and maintenance of databases designed for scientific research purposes. (10%)
6. Knowledge of and experience with the OMBIPRA approval process for data collection programs. (5%)

BASIS FOR AWARD

Proposals will be evaluated based upon the technical evaluation factors listed above. Award of the contract resulting from this RFP will be made to the Offeror whose quote offers the best overall value to the Government in terms of price and technical capability. The Government reserves such right of flexibility in conducting the evaluation as is necessary to assure a placement of a contract in the Government's best interest. Accordingly, the Government may award any resulting contract to other than the lowest priced Offeror, or to other than the Offeror with the highest evaluation rating.

Contact Documentation

This section is to be completed by the interviewer and the person interviewed. It documents efforts to contact you or your company, and indicates who spoke with whom and when.

Interviewer: _____

This section documents efforts to contact vessel owners that have been randomly selected for this interview. Once this form is begun for a single person, please continue to use it for this individual throughout the contact and interview process. Please add any information as it becomes relevant.

1. Primary Contact Information of Selected Vessel Owner

Please complete with all known information. If additional phone or contact information becomes available, please add notes in the comment sections.

Owner ☐

Designee of Owner ☐

Last Name	First Name, Initial, Suffix	Vessel ID #
Address	City	State, Zip code
Business Phone (area code & number)	Home Phone (area code & number)	Mobile Phone (area code & number)
Fax (area code & number)	Email Address 1	Email Address 2
Comments:		

2. Contact Log

Please complete the log when any attempt to contact the permit holder is made.

Owner ☐

Designee of Owner ☐

Interviewer	Date/Time	Method (phone #, email)	Disposition (e.g. busy signal, refused)

3. Indicate Time and Location for In-Person Interview:

Owner ☐

Designee of Owner ☐

Date/Time Scheduled: _____ Location: _____

Final Disposition (e.g. Interview completed, respondent refused, etc.):

4. Additional Comments

Please add any additional comments if relevant.

TEXAS OFFSHORE COMMERCIAL SHRIMP SURVEY FOR THE 2002 SEASON

Greetings:

You have been randomly selected from over 1,200 offshore commercial shrimp fishermen in Texas to help NOAA Fisheries better understand your industry. NOAA Fisheries would like to make this study as statistically valid as possible, so it is important that you, and the others who are selected, participate.

This survey focuses on collecting financial information on shrimp fishing businesses, and social data about the people who catch shrimp in Texas. Our primary goal is to gather information that will help fishery analysts assess how regulatory measures that might be proposed in the future will affect your bottom line, your family and your community. Collecting this information is needed to ensure that national goals, objectives, and requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MFCMA) and other laws are met. Responses to this survey is voluntary, but fishermen who take part in economic studies are protecting their own interests.

The survey is being conducted by MRAG Americas, Inc. through a contract issued by the Fisheries Economics Office in the Southeast Regional Office of NOAA Fisheries. A summary report will be developed from this effort, but all individual vessel data is kept strictly confidential as required by Section 402(b) of MFCMA and NOAA Administrative Order 216-100, "Confidentiality of Fishery Statistics."

In developing this survey form, we have tried to ask as few questions as possible. For example, we will be relying on state and federal permit, and US Coast Guard Documentation data for information about your fishing vessel. The public reporting burden for completing this survey is estimated to average one hour and seven minutes¹.

The survey is divided into two main sections:

Section I asks about the gears you use in your fishing operation and the costs you incur. This information will allow economists from NOAA fisheries to estimate net revenues and crew income in the fishery under current conditions. In the past, limited information was available for these estimates, and regulations were implemented without solid estimates of how the new regulations would directly affect earnings in the fishery. We hope that by

¹ Public reporting burden for this collection of information is estimated to average one hour and seven minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Dr. Michael Travis, Fisheries Economics Office, Southeast Regional Office, NOAA Fisheries, 9721 Executive Center Drive N., St. Petersburg, FL 33702-2432, (727) 570-5335, email: mike.travis@noaa.gov.

gathering this information now, we will gain a new tool to work with industry to help manage the offshore shrimp fishery in a sustainable way that also allows shrimp fishermen to continue earning a living in the Gulf of Mexico shrimp fishery.

Section II asks for information about you, your family, and your crewmembers. These questions will ask about your education level, your household income levels, other jobs you might hold, and your race. This information is necessary to understand your relative dependence on the shrimp fishery, and other opportunities for income generation you or your family members have. Race demographic information is being requested so that we can document whether new or existing regulations are balanced in terms of the different groups of fishers they affect, or if they discriminate unfairly against a certain group. Studies of this type, known as “environmental justice” assessments, are required when any new regulation is proposed. This section will also ask information about your crewmembers—in particular about where your crewmembers live, their ages and their ethnicity. Currently very little information is collected about crewmembers. This information will help analysts gain additional understanding about how the fishery contributes to local and regional economies. We recognize that you may not have complete information about your crew, but whatever information you can provide will be very helpful.

Thank you for your cooperation with this important survey effort!

Note: Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.

Section I: Fishing Operations and Costs

This section of the survey form asks questions about the vessel, gear, costs, and crew.

1. Vessel Information

The person interviewed is the (check one):

Vessel Owner ☐ Lessee ☐ Manager ☐ Captain ☐

Other ☐ (Specify: _____)

- 1.1 In order to connect the information on this form to the correct permit and vessel information, and catch information available in other datasets, please verify that the following is correct:

The following weights of landings were measured:

☐ Heads on

☐ Heads off

Vessel Name	US Coast Guard or State Registration #	Total landings in 2002 Shrimp Fisheries (pounds)	Total gross revenue in 2002 Shrimp Fisheries (\$)	Total landings in 2000 Shrimp Fisheries (pounds)	Total gross revenue in 2000 Shrimp Fisheries (\$)
		lbs	\$	lbs	\$

- 1.2 Please specify the port and state from which this vessel operated during the 2002 season: City _____, State _____

Interviewer Note: *In this case, primary port refers to the port that the operator considers the base of the vessel's operations, and is most likely the location where the vessel is kept when it is not actively fishing. This may be different from the landings ports. It is assumed that landings ports will be reported in the landings database.*

- 1.3 Did you shrimp in Federal waters (i.e. the EEZ¹) of the Gulf of Mexico?

In 2000: Yes ☐ No ☐

In 2002: Yes ☐ No ☐

¹The Exclusive Economic Zone (EEZ) portion of the fishery is from 9 nautical miles outward off of the Texas and West Florida coasts, and from 3 nautical miles outward off the coasts of Louisiana, Mississippi, and Alabama.

- 1.4 In 2000 and 2002, what was the number of trips and days at sea for this vessel in the offshore shrimp fishery (outside the COLREGS line or beach) and the inshore shrimp fishery (inside the COLREGS line or beach)?

Year	2000			2002		
Area	Offshore	Inshore	Total	Offshore	Inshore	Total
# of Trips						
Days at Sea						

Interviewer Note: If the respondent cannot break the number of trips and/or days at sea into inshore and offshore, please request and record the total number of trips and total days at sea.

- 1.5 How many days at sea did this vessel operate in non-shrimp fisheries during:
2000 _____ 2002 _____

- 1.6 Please specify the following information about your acquisition of this vessel.

Year Purchased	Builder/Brand	Purchase Price (\$)
		\$

Interviewer Note: Builder and Brand are often indicators of the quality of the vessel. A "Delta" vessel is much different than a "Marco" vessel even though the length and tons may be similar. With this information, it is also possible to correlate values to values listed in trade journals.

- 1.7 Not including the purchase price of the vessel, please estimate how much you have further invested in the engines, replacement parts, gear, electronics, etc., since you obtained the vessel. \$ _____

Interviewer Note: Refurbishing the vessel so that it is seaworthy and fishable would be part of these expenses. Expenditures on repairs should NOT be included.

- 1.8 What price do you think you could have gotten for your vessel, including gear and electronics, in 2000? What if you tried to sell it today?

2000 \$ _____ today: \$ _____

Interviewer Note: If the respondent says that it is not worth anything, please that verify that the value entered is "0".

- 1.9 What is the equity (net value) in this vessel now (that is, the estimated amount you would receive above what you owe, if you were to sell it today)?
\$ _____

- 1.10 If you had to buy a brand new vessel today, built and equipped identical to your current vessel, how much do you believe you would have to pay for it?
\$ _____

1.11 How often do you pull your vessel out of the water (dry dock) for hull and other major exterior maintenance?

Once every years

1.12 What is the typical cost (e.g. railway fees, etc.) for hauling your vessel out of the water, and the ensuing hull maintenance? (Please include costs for cleaning, replacing anodes, and painting and repairing the hull. Please do not include engine repair/replacement in this estimate.)

\$ _____

2. Major Mechanical Systems

Please provide information about the engines, generators, compressors and reduction gear you currently use on the vessel.

Make/ Model	Installed horse- power or kw	Purchase Price	Year Purchased	Hours used per day	Will your next major cost be an overhaul (O) or replacement (R)	Years until you expect to replace or overhaul	Expected cost when you next invest in this engine.
		\$					\$
		\$					\$
		\$					\$
		\$					\$
		\$					\$
		\$					\$

Main Engine =

4

Auxiliary Engine = 5

Engine for refrigeration/processing =

995

Generator for refrigeration/processing =

994

Reduction gear =

1000

Compressor

1001

Interviewer Note: (1) Interviewer Note: This covers not just main engines, but all sources of propulsion/power, such as auxiliary engines/generators (which may not be measured in Horsepower) and diesel engines needed to power the freezer compressors. (2) Engine manufacturers maintain databases that indicate expected fuel use at various horsepower ratings as well as expected overhaul costs and expected hours between overhaul.

3. Trawl Gear Information

The shaded table below lists a set of codes for gear type, net type and mesh type for typical shrimping gears used. Please use the codes in the table to complete the table in the next question.

Code	Gear Type	Code	Net Type	Code	Mesh Type
A	Otter Trawl	I	2 Seam Balloon	S	Nylon
B	Butterfly Net	J	4 Seam Balloon	T	Spectra
C	Cast Net	K	Box	U	Poly
D	Skimmer Net	L	Flat	V	Other (specify)
E	Wing Net	M	Western Jib	W	Other (specify)
F	Roller Frame	N	Add-on Bib		
G	Other (specify)	O	Built-in Bib (e.g. mongoose, cobra, etc.)		
H	Other (specify)	P	Other (specify)		
		Q	Other (specify)		
		J	Other (specify)		
		R	Other (specify)		

3.1 Using the codes from the table above, please specify the gear owned, gear used, percent of fishing time in 2002, replacement cost, and the typical number of years that the net may be used before it needs to be replaced.

Gear Codes	Net type code	Mesh type code	Headrope length (feet)	Mesh size (inches)	Number On Board	Number Fished/ Towed	Percent of 2002 fishing time (%)	Average cost per net	Average life of net
			ft	in			%	\$	
			ft	in			%	\$	
			ft	in			%	\$	
			ft	in			%	\$	
			ft	in			%	\$	
			ft	in			%	\$	

Percentages should
total 100%

Interviewer Note: *Rough estimates are ok for the last three columns.*

3.2 Please indicate replacement costs and the typical number of years each may be used before it needs to be replaced.

Interviewer Note: If respondent doesn't specify cable types, enter total in Main Cable row and indicate "see Main Cable" in subsequent rows.

Doors	Number of sets on board	Replacement cost per set	Average life (in years)
Aluminum Trawl Doors		\$	
Wood Trawl Doors		\$	

Cable	Total length (ft)	Cost per foot	Average life (years)
Main Cable	ft	\$	
Bridle Cable	ft	\$	
Trynet Cable	ft	\$	
Other (specify)_____	ft	\$	
Other (specify)_____	ft	\$	

3.3 In 2002, what type of BRD (bycatch reduction device) did you use? Indicate the approximate percent of total fishing time by each type used.

Jones-Davis _____%	Fisheye _____%	None _____%
Other (please specify)_____		

Interviewer Note: Interviewers should be sure that percentages add to 100%. If no BRDs were used then by "none" indicate 100%. If no BRD was used 50% of the time then put 50% by none and indicate percentages by other types.

- 3.4 Please indicate the type of turtle excluder device (TED) you used by percent of total fishing time in 2002. If you own a particular type of TED but did not use it in 2002, please indicate 0% in time used, but complete the cost information.

☐

Single Grid Hard TEDs

Grid style ¹	grid size (width x height)	opening size (width x length)	Opening direction	Accelerator Used	Flap size	# on board	Cost ² per unit	% of time used
	<input type="checkbox"/> 28"x28" Gulf min <input type="checkbox"/> 30"x30" Atlantic min <input type="checkbox"/> Other _____"x_____"	<input type="checkbox"/> 32"x10" Gulf min <input type="checkbox"/> 35"x12" Atlantic min <input type="checkbox"/> Other _____"x_____" <input type="checkbox"/> Leatherback <input type="checkbox"/> Double-Cover		<input type="checkbox"/> Yes <input type="checkbox"/> No			\$	
	<input type="checkbox"/> 28"x28" Gulf min <input type="checkbox"/> 30"x30" Atlantic min <input type="checkbox"/> Other _____"x_____"	<input type="checkbox"/> 32"x10" Gulf min <input type="checkbox"/> 35"x12" Atlantic min <input type="checkbox"/> Other _____"x_____" <input type="checkbox"/> Leatherback <input type="checkbox"/> Double-Cover		<input type="checkbox"/> Yes <input type="checkbox"/> No			\$	
	<input type="checkbox"/> 28"x28" Gulf min <input type="checkbox"/> 30"x30" Atlantic min <input type="checkbox"/> Other _____"x_____"	<input type="checkbox"/> 32"x10" Gulf min <input type="checkbox"/> 35"x12" Atlantic min <input type="checkbox"/> Other _____"x_____" <input type="checkbox"/> Leatherback <input type="checkbox"/> Double-Cover		<input type="checkbox"/> Yes <input type="checkbox"/> No			\$	

Opening direction: A = Top-opening
B = Bottom- opening

Flap size: 1 = Std. Short
2 = Std. Long
3 = No Flap Used
4 = Double-Cover

☐

Parker Soft TEDs

opening type	Opening direction	Accelerator Used	number on board	Cost ² per unit	percent of time used
		<input type="checkbox"/> Yes <input type="checkbox"/> No		\$	
		<input type="checkbox"/> Yes <input type="checkbox"/> No		\$	
		<input type="checkbox"/> Yes <input type="checkbox"/> No		\$	

Opening type: 1 = Standard
2 = Leatherback

Opening direction: A = Top-opening
B = Bottom-opening



Hooped Hard TEDs

Grid style ¹	opening size	Opening direction	Accelerator Used	number on board	Cost ² per unit	percent of time used
NMFS	<input type="checkbox"/> 25"x25" – Gulf min <input type="checkbox"/> 30"x30" – Atlantic min <input type="checkbox"/> Other _____" x _____"		<input type="checkbox"/> Yes <input type="checkbox"/> No		\$	
Cameron	<input type="checkbox"/> 25"x25" – Gulf min <input type="checkbox"/> 30"x30" – Atlantic min <input type="checkbox"/> Other _____" x _____"		<input type="checkbox"/> Yes <input type="checkbox"/> No		\$	
Coulon	<input type="checkbox"/> 25"x25" – Gulf min <input type="checkbox"/> 30"x30" – Atlantic min <input type="checkbox"/> Other _____" x _____"		<input type="checkbox"/> Yes <input type="checkbox"/> No		\$	

Opening direction: A = Top-opening
B = Bottom-opening

Total for all TED use should equal 100%.

SEE FIGURES on NEXT PAGES

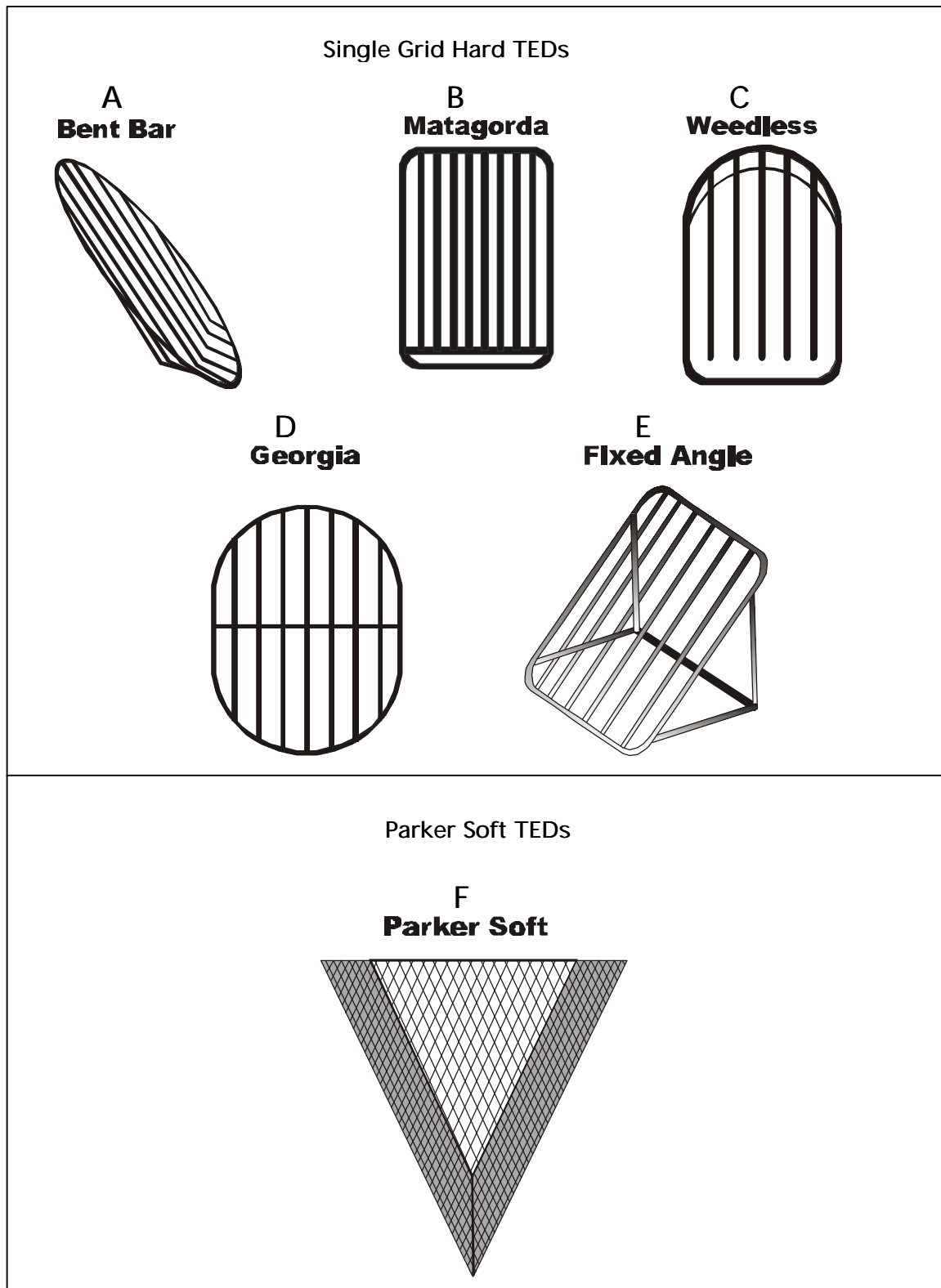
Notes:

¹See diagram

²Include cost of installing the TED

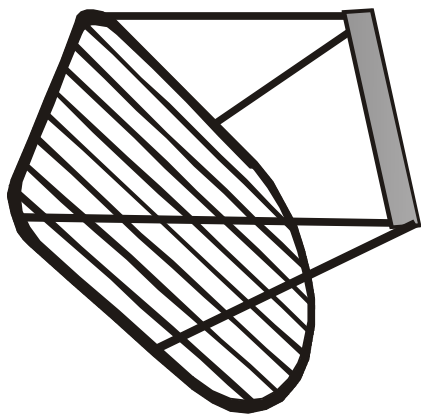
Interviewer Note: In last column, interviewers should be sure that percentages add to 100%.

Figure 1. Common Turtle Excluder Devices

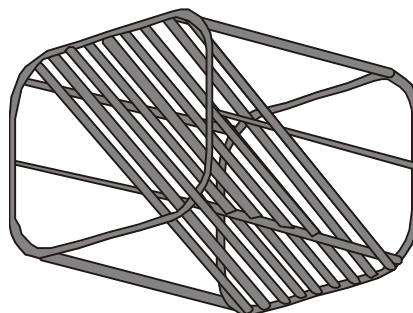


Hooped Hard TEDs

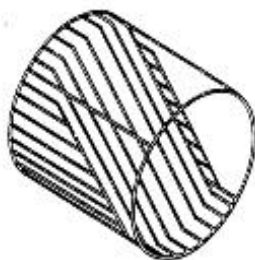
G
Coulon



H
NMFS



I
Cameron



4. Electronics

4.1 In the list below, please check off the types of electronic equipment (either in the wheelhouse or mounted on the gear) that were on-board your vessel in 2002.

If your vessel had more than one unit of a particular type of equipment, please write in the number of units. Note that this list contains types of equipment that may not be presently used in the Gulf shrimp fishery, but are used in other fisheries for which this type of information is being collected.

Item	Code	Total Number of units (including backups)	Average purchase cost per unit	Average replacement cost per unit
<input type="checkbox"/> Cell phone	907		\$	\$
<input type="checkbox"/> VHF radio	909		\$	\$
<input type="checkbox"/> CB Radio	1010		\$	\$
<input type="checkbox"/> Single sideband radio	927		\$	\$
<input type="checkbox"/> Satellite phone	1011		\$	\$
<input type="checkbox"/> Fax	904		\$	\$
<input type="checkbox"/> Plotter	1012		\$	\$
<input type="checkbox"/> Computer (including software)	925		\$	\$
<input type="checkbox"/> Printer	920		\$	\$
<input type="checkbox"/> Hailer (Boat intercom)	1013		\$	\$
<input type="checkbox"/> Loran	901		\$	\$
<input type="checkbox"/> Vessel Tracking System	908		\$	\$
<input type="checkbox"/> Radar	902		\$	\$
<input type="checkbox"/> Global Positioning System (GPS)	906		\$	\$
<input type="checkbox"/> Auto Pilot	922		\$	\$
<input type="checkbox"/> EPIRB	1014		\$	\$
Echo Sounder/Depth Recorder paper <input type="checkbox"/> video <input type="checkbox"/> digital <input type="checkbox"/>	903		\$	\$
<input type="checkbox"/> Electronic Compass	916		\$	\$
<input type="checkbox"/> Satellite Navigation System (SatNav)	919		\$	\$
<input type="checkbox"/> Radio Direction Finder	928		\$	\$
<input type="checkbox"/> Weather Satellite Receiver	917		\$	\$
<input type="checkbox"/> Wind Meter	918		\$	\$
<input type="checkbox"/> Net Pingers	946		\$	\$
<input type="checkbox"/> Temperature Profiling System	926		\$	\$
<input type="checkbox"/> Water Temperature Sensor	939		\$	\$
<input type="checkbox"/> Single direction sonar	913		\$	\$
<input type="checkbox"/> Multiple direction sonar	914		\$	\$
<input type="checkbox"/> Water salinity Sensor	943		\$	\$
<input type="checkbox"/> Other (specify) _____	1015		\$	\$

- 4.2 Please estimate the total cost of electronics equipment you realistically expect to spend over the next five years.

\$ _____

5. Annual and Variable Costs

Please fill out the table below indicating the annual costs to your vessel for the 2000 and 2002 season. Please include all costs including those costs shared by the crew. Do not include replacement costs. Reminder: Your individual responses will remain confidential.

Operating Costs of Vessel	2000 Estimate	2002 Estimate
5.1 Fuel (total cost including amounts paid by crewmembers)	\$	\$
5.1.1 How much fuel is purchased in an average year (gallons)		
5.1.2 What was the average price per gallon paid for fuel (\$/gallon) Interviewer Note: For the above three questions, one value may be calculated. Check to be sure that it makes sense and that the respondent agrees with that value.	\$	\$
5.2 Oil and lubricants	\$	\$
5.3 Groceries (total cost including amounts paid by crewmembers)	\$	\$
5.4 Total packing costs, if any	\$	\$
5.5 Total payments to captain	\$	\$
5.6 Total payments to crewmembers (excluding captain)	\$	\$
5.7 Payroll Taxes	\$	\$
5.8 Insurance (check appropriate boxes, and provide total cost). <input type="checkbox"/> Hull <input type="checkbox"/> Protection & Indemnity (P & I) Insurance <input type="checkbox"/> Health/Medical Insurance <input type="checkbox"/> Other Insurance: (Specify) _____	\$	\$
5.9 Utilities (e.g. dock electricity)	\$	\$
5.10 Misc. Marine Hardware & Supplies (cable, line, etc.)	\$	\$
5.11 Dock or Mooring Fees	\$	\$
5.12 Cost of leases of property adjacent to dock (if any)	\$	\$
5.13 Repair & Maintenance: Electronics (Please, no replacement costs)	\$	\$
5.14 Repair & Maintenance: Gear (e.g. net repairs, trawl door repairs. (Please no replacement costs)	\$	\$
5.15 Annual repair & maintenance: Hull, Engine, Reduction gear. (e.g. filters. Please do not include costs from question 1.11)	\$	\$

5.16 Depreciation Charges Check the type of depreciation method used (one box only) <input type="checkbox"/> MACRS 1 <input type="checkbox"/> Declining Balance 3 <input type="checkbox"/> Straight Line 2 <input type="checkbox"/> Sum-of-the-Year's Digits 4 <input type="checkbox"/> Other 5 (specify _____)	\$	\$
5.17 Cost of State or Federal Licenses/Regulatory Fees <i>Interviewer Note: Include Coast Guard inspection fees and state and federal vessel registration and licenses, export/import fees, etc. Do not include fines as these are not assumed to be repeated expenses.</i>	\$	\$
5.18 Property Tax Paid (Related to this vessel only)	\$	\$
5.19 Professional Fees (Surveyor, Accountant, Lawyer, Association dues, etc)	\$	\$
5.20 Vessel management fee, if applicable	\$	\$
5.21 Vessel and other long-term fishing related loans—principal and interest <i>Interviewer Note: An example is the loan used to purchase the vessel. In this case ask for both principal and interest payments.</i>	\$	\$
5.22 Annual Operating and other short-term fishing related loan interest <i>Interviewer Note: An example of a short-term loan is one in which the buyer lends annual operating expenses to the Owner at the beginning of the year. In this case the interviewer should not include the principal of the loan only the interest. (Because it is a short term operating loan, the expenses it covers are included in other costs collected in this survey.</i>	\$	\$
5.23 Vehicle expenses used in fishing operations (depreciation, gas, etc.)	\$	\$

5.24 If you iced your shrimp what was the...

Price for ice: 2000: \$_____/unit 2002: \$_____/unit.

Choose unit: Block (B) ☐ Bar (R) ☐ Pounds (P) ☐
(Blocks and Bars are 300 pound units)

Quantity of units used in 2000: _____

Quantity of units used in 2002: _____

5.25 If you froze your shrimp what was the...

Cost for maintaining your freezing equipment in:

2000 \$ _____ 2002 \$ _____

Cost of salt and other freezing supplies in:

2000 \$ _____ 2002 \$ _____

5.26 Please describe any other annual expenses in 2000 not already included.

2000 expense amount \$ _____

Description of expense _____

5.27 Please describe any other annual expenses in 2002 not already included.

2002 expense amount \$ _____

Description of expense _____

6. Net Revenue

6.1 Please indicate this vessel's net revenue for 2000 and 2002, excluding any crew or captain's share to you.

2000 \$ _____ 2002 \$ _____

6.2 Please indicate the net revenue from other activities for this fishing vessel in 2002. Include other non-shrimp commercial fishing, charter fishing, and non-fishing activities, but only **NET** revenue derived using **THIS** vessel.

2000 \$ _____ 2002 \$ _____

Interviewer Note: *The interviewer should be sure that numbers provided are net revenues not gross revenues.*

7. Vessel Owner, Crewmembers and Crew Compensation

7.1 Please indicate the owner's relationship to the vessel and the captain.

Owner's Relationship to Vessel	Check One	Owner's Relationship to Captain	Check One
Owner owns 100% of vessel.		Owner is always captain	
Owner owns 50% or more of the vessel, but less than 100%		Owner is captain 50% or more of trips, but less than 100%.	
Owner owns 10% or more of vessel but less than 50%		Owner is skipper 10% or more of trips, but less than 50%.	
Owner owns less than 10% of vessel		Owner is captain less than 10% of trips.	
Owner leases the vessel		Owner is never the captain or crew.	
Other (specify)		Other (specify)	

7.2 Do you own other fishing vessels? Yes ☐ No ☐

If yes, how many vessels? (enter number)

Please identify these vessels.

Vessel name	US Coast Guard or State Registration #

7.3 Including the captain, how many crewmembers do you use on an average trip?

7.4 How does your crew change if you are expecting a larger than normal catch?
(fill in number): + crewmember

7.5 Please describe your typical crew including the captain.

Position (specify)	Years of commercial fishing experience	Typical crew share for this position—percent of gross revenue.	Typical piecemeal pay for this position. (specify \$ per box)	City, State, & Country where crewmember lives	Is the crewmember a member of the Owners family (Check if Yes)
			\$		
			\$		
			\$		
			\$		
			\$		
			\$		
			\$		

Interviewer Note: (1) Typical crew share for this position Interviewer should enter either a crew share or a piecemeal rate in the next column. When entering shares, make sure to stress that crew share should be expressed as the percent of GROSS REVENUE. Some Owners may normally calculate as a percent of Net Revenue—these will have to be recalculated by the Owner. Remember that Gross Revenue is listed in the first question. (2) Typical piece-meal rate for this position. Interviewer should enter either the piecemeal rate (with units) in this column or crew-share in the previous column but not both unless it is specified.

7.6 If the vessel owner is not a member of the crew, please indicate the number of years the owner has been involved in commercial fishing. _____

7.7 Do crewmembers pay shares of any variable cost items?

Yes ☐

No ☐

If yes, please complete the following table. As an example if the boat pays 25% of the fuel and each of the five crewmembers split the remaining 75 %, then enter 25% for the boat share and 75 % for the crew share.

Variable Cost Item	Total Boat share (%)	Total Crew Share (%)
Groceries	%	%
Fuel	%	%
Ice	%	%
Other, (please specify)_____	%	%
Other, (please specify)_____	%	%
Other, (please specify)_____	%	%

Interviewer Note: *If an item is not shared by the crew, enter 100 under boat share and 0 under crew share.*

7.8 Did your crew receive some type of bonus in 2000?

Yes ☐ No ☐

If yes please indicate that total bonus amount paid for the 2000 fishing year.
\$ _____

7.9 Did your crew receive some type of bonus in 2002?

Yes ☐ No ☐

If yes please indicate that total bonus amount paid or expected to be paid for the 2002 fishing year. \$ _____

Interviewer Note: *All bonuses may not have been paid. Try to get an estimate even if they haven't been paid.*

8. Effort Management in the shrimp fishery

8.1 Use one of the following to describe your attitude toward each of the effort management programs listed in the table for the shrimp fishery.

Support: You would support the program for use in the shrimp fishery

Neutral or No Opinion.

Oppose: You would oppose the program for use in the shrimp fishery.

Definitions:

IFQ – Individual Fishing Quotas

TAC – Total Allowable Catch

IEQ – Individual Effort Quotas

Control Date – Date after which a vessel without a federal permit may not be assured of future participation in the fishery should a limited entry program be implemented in federal waters

A.	Establish a control date for permits. ____ Support ____ Neutral ____ Oppose
B.	Non-transferable Permit Limitation: There would be a limit on the number of vessels that could participate—initially permits would be limited to those who meet particular criteria. ____ Support ____ Neutral ____ Oppose

C.	Permit Limitation: There would be a limit on the number of vessels that could participate—initially, permits would be limited to those who meet particular criteria. New entrants would have to buy their way into the fishery. ____ Support ____ Neutral ____ Oppose
D.	Total Catch Management System: Before the season began, fishery managers would determine a TAC. Catches would be reported regularly, and as total catch approached the TAC, managers would close the fishery. ____ Support ____ Neutral ____ Oppose
E.	Non-transferable Individual Fishing Quotas (IFQs): Participants with a history in the fishery would be assigned a percentage of the TAC and allowed to catch the resulting pounds of shrimp at times that were best for each vessel. Transferability of catch percentages would allow for fleet consolidation. New entrants would have to buy their way into the fishery. ____ Support ____ Neutral ____ Oppose
F.	Community Fishing Quotas: Communities with a history in the fishery would be assigned a percentage of the TAC. Each community would be allowed to catch the resulting pounds of shrimp at times that were best for each operation. ____ Support ____ Neutral ____ Oppose
G.	Non-Transferable Individual Effort Quotas (IEQs): Participants with a history in the fishery would be assigned a fixed number of effort units (fishing days for example). Each participant would be allowed to expend only that amount of effort, but could catch as much as possible within their effort limit. ____ Support ____ Neutral ____ Oppose
H.	Individual Effort Quotas: Participants with a history in the fishery would be assigned a fixed number of effort units (fishing days for example). Each participant would be allowed to expend only that amount of effort, but could catch as much as possible within their effort limit. Transferability of effort units would allow for fleet consolidation. New entrants would have to buy their way into the fishery. ____ Support ____ Neutral ____ Oppose
I.	Community Effort Quotas: Communities with a history in the fishery would be assigned a fixed number of effort units (fishing days for example). Each community would be allowed to expend only that amount of effort, but could catch as much as possible within their effort limit. ____ Support ____ Neutral ____ Oppose

8.2 How would your support of IFQs change if quota collections were based on each vessel's fishing power or fishing capacity?

____ More likely ____ Less likely

8.3 How would your support of IEQs change if quota allocations were based on each vessel's fishing power or fishing capacity?

____ More likely ____ Less likely

In response to comment from OMB, NOAA has corrected option 8.1E, which will be replaced with the following two option descriptions:

Transferable Individual Fishing Quotas (IFQs): Participants with a history in the fishery would be assigned a percentage of the TAC and allowed to catch the resulting pounds of shrimp at times that were best for each vessel. Transferability of catch percentages would allow for fleet consolidation. New entrants would have to buy their way into the fishery.

Non-transferable Individual Fishing Quotas (IFQs): Participants with a history in the fishery would be assigned a percentage of the TAC and allowed to catch the resulting pounds of shrimp at times that were best for each vessel. No transferability of catch percentages would be allowed between fishermen.

Section II. Owner or Designee and Crewmember Demographics

This section collects demographic information about the Owner or Owner's designee and crewmembers. Reminder: Your individual responses will remain confidential.

9. Owner or Designee Information

9.1 Please indicate your age _____

9.2 Please indicate your marital status.

____Married ____Single ____Divorced ____Widowed
____Other (specify) _____

9.3 Please indicate the number of persons in your household (do not include paid borders/renters) _____

9.4 Please indicate the highest degree or level of school the owner has completed .

____No schooling completed	____High School Graduate (Diploma/GED)
____Nursery school to 4 th grade	____Some college credit, less than 1 year
____5 th or 6 th grade	____1 or more years of college, no degree
____7 th or 8 th grade	____Associate's degree (ex: AA, AS)
____9 th grade	____Bachelor's degree (ex: BA, AB, BS)
____10 th grade	____Master's degree (ex: MA, MS, MEng, MEd, MSW, MBA)
____11 th grade	____Professional degree (ex: MD, DDS, DVM, LLB, JD)
____12 th grade, No Diploma	____Doctorate degree (ex: PhD, EdD)

9.5 Are you Spanish/Hispanic/Latino?

____Yes ____No

Interviewer Note: *If the respondent indicates no, please go to the next question.*

If Yes, is the Owner Mexican, Mexican Am., Chicano: _____

Or Puerto Rican: _____

Or Cuban: _____

Or Other Spanish/Hispanic/Latino (specify) _____

9.6 What is the race of the Owner: Check/specify one or more

<input type="checkbox"/> White	<input type="checkbox"/> Asian Indian
<input type="checkbox"/> Black, African American, or Negro	<input type="checkbox"/> Chinese
<input type="checkbox"/> American Indian or Alaska Native (Specify enrolled or principal tribe) _____	<input type="checkbox"/> Filipino
<input type="checkbox"/> Native Hawaiian	<input type="checkbox"/> Japanese
<input type="checkbox"/> Guamanian or Chamorro	<input type="checkbox"/> Korean
<input type="checkbox"/> Samoan	<input type="checkbox"/> Vietnamese
<input type="checkbox"/> Other Pacific Islander (Specify) _____	<input type="checkbox"/> Other Asian (Specify) _____
	<input type="checkbox"/> Other Race (Specify) _____

9.7 Do you speak a language other than English at home?

☐ Yes ☐ No

9.7.1 If yes, what is this language? (For example: Korean, Italian, Spanish, Vietnamese) _____**9.8** Please indicate your religious affiliation. Indicate none if not religious.

9.9 In addition to managing and/or operating this shrimp vessel, what other employment or work do you do? _____

Interviewer Note: *Interview should be certain not to include any other income earned on the vessel as specified in Question 6.2*

9.9.1 During which months of the year do you normally do this other work? _____**9.10** Please check the total income for your household.

<input type="checkbox"/> Less than \$10,000	<input type="checkbox"/> \$50,000 to \$74,999
<input type="checkbox"/> \$10,000 to \$14,999	<input type="checkbox"/> \$75,000 to \$99,999
<input type="checkbox"/> \$15,000 to \$24,999	<input type="checkbox"/> \$100,000 to \$149,999
<input type="checkbox"/> \$25,000 to \$34,999	<input type="checkbox"/> \$150,000 to \$199,999
<input type="checkbox"/> \$35,000 to \$49,999	<input type="checkbox"/> \$200,000 or more

10. Information about Crewmember Number 1

Interviewer Note: *The intent here is to get as much information about CURRENT crewmembers as possible from respondent. Do not attempt to get information directly from the crewmembers. In collecting this information the Interviewer should stress that the person providing the information should do so only if they are reasonably certain about the information.*

10.1 Position _____

10.2 Please indicate the approximate age of crewmember _____

10.3 If known, please indicate marital status of crewmember.

____Married ____Single ____Divorced ____Widowed
____Other (specify)_____ ____Unknown

10.4 If known, please indicate crewmember's level of education.

____Unknown ____Some College
____No High School Diploma ____College Graduate
____High School Graduate ____Graduate School

10.5 Is the crewmember Spanish/Hispanic/Latino?

____Yes ____No ____Unknown

If the respondent indicates no, please go to the next question.

If Yes, is the crewmember Mexican, Mexican Am., Chicano: _____

Or Puerto Rican: _____

Or Cuban: _____

Or Other Spanish/Hispanic/Latino (specify) _____

10.6 What is the race of the crewmember: Check/specify one or more

<input type="checkbox"/> White	<input type="checkbox"/> Asian Indian
<input type="checkbox"/> Black, African American, or Negro	<input type="checkbox"/> Chinese
<input type="checkbox"/> American Indian or Alaska Native (Specify enrolled or principal tribe) _____	<input type="checkbox"/> Filipino
<input type="checkbox"/> Native Hawaiian	<input type="checkbox"/> Japanese
<input type="checkbox"/> Guamanian or Chamorro	<input type="checkbox"/> Korean
<input type="checkbox"/> Samoan	<input type="checkbox"/> Vietnamese
<input type="checkbox"/> Other Pacific Islander (Specify) _____	<input type="checkbox"/> Other Asian (Specify) _____
	<input type="checkbox"/> Other Race (Specify) _____

10.7 If known, does the crewmember speak a language other than English at home?

☐ Yes ☐ No ☐ Unknown

10.7.1 If yes, what is this language? (For example: Korean, Italian, Spanish, Vietnamese) _____**10.8** If known, please indicate the crewmember's religion. Indicate none if not religious, and unknown if you are not reasonably certain. _____**11.** Information about Crewmember Number 2**11.1** Position _____**11.2** Please indicate the approximate age of crewmember _____**11.3** If known, please indicate marital status of crewmember.

☐ Married ☐ Single ☐ Divorced ☐ Widowed

☐ Other (specify) _____ ☐ Unknown

11.4 If known, please indicate crewmember's level of education.

Unknown

_____Some College

____No High School Diploma

____ College Graduate

_____ High School Graduate

____ Graduate School

11.5 Is the crewmember Spanish/Hispanic/Latino?

 Yes

 No

Unknown

If the respondent indicates no, please go to the next question.

If Yes, is the crewmember Mexican, Mexican Am., Chicano: _____

Or Puerto Rican:

Or Cuban: _____

Or Other Spanish/Hispanic/Latino (specify) _____

11.6 What is the race of the crewmember: Check/specify one or more

White

Asian Indian

____Black, African American, or Negro

Chinese

____American Indian or Alaska Native (Specify
enrolled or principal tribe)_____

Filipino

_____ Native Hawaiian

_____Japanese

Guamanian or Chamorro

Korean

Samoan

Vietnamese

____ Other Pacific Islander (Specify) _____

____Other Asian (Specify) _____

____ Other Race (Specify) _____

11.7 If known, does the crewmember speak a language other than English at home?

_____ Yes

 No

Unknown

11.7.1 If yes, what is this language? (For example: Korean, Italian, Spanish, Vietnamese) _____

11.8 If known, please indicate the crewmember's religion. Indicate none if not religious, and unknown if you are not reasonably certain. _____

12. Information about Crewmember Number 3

12.1 Position _____

12.2 Please indicate the approximate age of crewmember _____

12.3 If known, please indicate marital status of crewmember.

☐ Married ☐ Single ☐ Divorced ☐ Widowed
☐ Other (specify) _____ ☐ Unknown

12.4 If known, please indicate crewmember's level of education.

☐ Unknown ☐ Some College
☐ No High School Diploma ☐ College Graduate
☐ High School Graduate ☐ Graduate School

12.5 Is the crewmember Spanish/Hispanic/Latino?

☐ Yes ☐ No ☐ Unknown

If the respondent indicates no, please go to the next question.

If Yes, is the crewmember Mexican, Mexican Am., Chicano: _____

Or Puerto Rican: _____

Or Cuban: _____

Or Other Spanish/Hispanic/Latino (specify) _____

12.6 What is the race of the crewmember: Check/specify one or more

<input type="checkbox"/> White	<input type="checkbox"/> Asian Indian
<input type="checkbox"/> Black, African American, or Negro	<input type="checkbox"/> Chinese
<input type="checkbox"/> American Indian or Alaska Native (Specify enrolled or principal tribe) _____	<input type="checkbox"/> Filipino
<input type="checkbox"/> Native Hawaiian	<input type="checkbox"/> Japanese
<input type="checkbox"/> Guamanian or Chamorro	<input type="checkbox"/> Korean
<input type="checkbox"/> Samoan	<input type="checkbox"/> Vietnamese
<input type="checkbox"/> Other Pacific Islander (Specify) _____	<input type="checkbox"/> Other Asian (Specify) _____
	<input type="checkbox"/> Other Race (Specify) _____

12.7 If known, does the crewmember speak a language other than English at home?
_____Yes _____No _____Unknown

12.7.1 If yes, what is this language? (For example: Korean, Italian, Spanish, Vietnamese) _____

12.8 If known, please indicate the crewmember's religion. Indicate none if not religious, and unknown if you are not reasonably certain. _____

13. Information about Crewmember Number 4

13.1 Position _____

13.2 Please indicate the approximate age of crewmember _____

13.3 If known, please indicate marital status of crewmember.

____Married _____Single _____Divorced _____Widowed
____Other (specify)_____ _____Unknown

13.4 If known, please indicate crewmember's level of education.

____Unknown _____Some College
____No High School Diploma _____College Graduate
____High School Graduate _____Graduate School

13.5 Is the crewmember Spanish/Hispanic/Latino?

____Yes _____No _____Unknown

If the respondent indicates no, please go to the next question.

If Yes, is the crewmember Mexican, Mexican Am., Chicano: _____

Or Puerto Rican: _____

Or Cuban: _____

Or Other Spanish/Hispanic/Latino (specify) _____

13.6 What is the race of the crewmember: Check/specify one or more

- | | |
|---|--|
| <input type="checkbox"/> White | <input type="checkbox"/> Asian Indian |
| <input type="checkbox"/> Black, African American, or Negro | <input type="checkbox"/> Chinese |
| <input type="checkbox"/> American Indian or Alaska Native (Specify enrolled or principal tribe) _____ | <input type="checkbox"/> Filipino |
| <input type="checkbox"/> Native Hawaiian | <input type="checkbox"/> Japanese |
| <input type="checkbox"/> Guamanian or Chamorro | <input type="checkbox"/> Korean |
| <input type="checkbox"/> Samoan | <input type="checkbox"/> Vietnamese |
| <input type="checkbox"/> Other Pacific Islander (Specify) _____ | <input type="checkbox"/> Other Asian (Specify) _____ |
| | <input type="checkbox"/> Other Race (Specify) _____ |

13.7 If known, does the crewmember speak a language other than English at home?

☐ Yes ☐ No ☐ Unknown

13.7.1 If yes, what is this language? (For example: Korean, Italian, Spanish, Vietnamese) _____

13.8 If known, please indicate the crewmember's religion. Indicate none if not religious, and unknown if you are not reasonably certain. _____

14. Information about Crewmember Number 5

14.1 Position _____

14.2 Please indicate the approximate age of crewmember _____

14.3 If known, please indicate marital status of crewmember.

☐ Married ☐ Single ☐ Divorced ☐ Widowed

☐ Other (specify) _____ ☐ Unknown

14.4 If known, please indicate crewmember's level of education.

Unknown

_____Some College

____No High School Diploma

____ College Graduate

____High School Graduate

____ Graduate School

14.5 Is the crewmember Spanish/Hispanic/Latino?

 Yes

 No

Unknown

If the respondent indicates no, please go to the next question.

If Yes, is the crewmember Mexican, Mexican Am., Chicano: _____

Or Puerto Rican: _____

Or Cuban: _____

Or Other Spanish/Hispanic/Latino (specify) _____

14.6 What is the race of the crewmember: Check/specify one or more

White

Asian Indian

____Black, African American, or Negro

Chinese

____American Indian or Alaska Native (Specify
enrolled or principal tribe)_____

____Filipino

Native Hawaiian

_____Japanese

_____Guamanian or Chamorro

_____Korean

Samoan

Vietnamese

____ Other Pacific Islander (Specify) _____

____ Other Asian (Specify) _____

____ Other Race (Specify) _____

14.7 If known, does the crewmember speak a language other than English at home?

_____ Yes

 No

Unknown

14.7.1 If yes, what is this language? (For example: Korean, Italian, Spanish, Vietnamese) _____

14.8 If known, please indicate the crewmember's religion. Indicate none if not religious, and unknown if you are not reasonably certain. _____

15. Information about Crewmember Number 6

15.1 Position _____

15.2 Please indicate the approximate age of crewmember _____

15.3 If known, please indicate marital status of crewmember.

____Married ____Single ____Divorced ____Widowed

____Other (specify)_____ ____Unknown

15.4 If known, please indicate crewmember's level of education.

____Unknown ____Some College

____No High School Diploma ____College Graduate

____High School Graduate ____Graduate School

15.5 Is the crewmember Spanish/Hispanic/Latino?

____Yes ____No ____Unknown

Interviewer Note: *If the respondent indicates no, please go to the next question.*

If Yes, is the crewmember Mexican, Mexican Am., Chicano: _____

Or Puerto Rican: _____

Or Cuban: _____

Or Other Spanish/Hispanic/Latino (specify) _____

15.6 What is the race of the crewmember: Check/specify one or more

____White ____Asian Indian

____Black, African American, or Negro ____Chinese

____American Indian or Alaska Native (Specify
enrolled or principal tribe)_____ ____Filipino

____Native Hawaiian ____Japanese

____Guamanian or Chamorro ____Korean

____Samoan ____Vietnamese

____Other Pacific Islander (Specify)_____ ____Other Asian (Specify) _____

____Other Race (Specify) _____

15.7 If known, does the crewmember speak a language other than English at home?
_____Yes _____No _____Unknown

15.7.1 If yes, what is this language? (For example: Korean, Italian, Spanish, Vietnamese) _____

15.8 If known, please indicate the crewmember's religion. Indicate none if not religious, and unknown if you are not reasonably certain. _____

Development of a Sampling Plan for Socioeconomic Survey of Offshore Gulf Shrimp Fishermen

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1 Introduction

This report has been prepared for the Marine Resources Assessment Group, Americas (MRAG), using data on the characteristics of the offshore gulf shrimp fleet that have primary landings sites in Texas (data provided through MRAG by Mike Travis, NMFS). Data on characteristics of the fleet were compiled by merging information from the US Coast Guard on registered vessels with NFMS information from a Gulf-wide shrimp dealer reporting program. The number of vessels for which such data exist is 1,207, and this is taken as the fixed, known size of the population of interest in this report. The data contain values for a number of physical characteristics of each vessel, such as age, length, and tonnage, and two measures of activity in 2001, total shrimp catch (Gulf only) and gross revenue.

The purpose of the survey to be conducted is to collect information on socioeconomic characteristics of the offshore fleet, with an emphasis on costs incurred and investments made at the level of individual vessels. It has been determined by NMFS that the survey will consist of about 10% of the total population, and it is strongly believed that some stratification of the population should be used to ensure coverage of various sectors that may exist in the fleet (e.g., small versus large vessels) and possibly improve efficiency (i.e., reduce variances) of the resulting estimators of population values. At this time, however, it has not been determined which, if any, characteristics of vessels for which data are available might be directly related to the response variables of interest in the survey.

This report develops a sampling and estimation strategy that may be used to provide both point and interval estimates of fleet-wide total and average values for responses of interest in the planned survey. The basic approach is that of *post-stratification*, but this is combined with a highly stratified initial sample designed to provide coverage of all sectors of the fleet relative to geographic location of pri-

mary port, size of vessel, and activity in 2001. While poststratified estimates are certainly valid in their own right, gains in efficiency may be realized if fixed stratification is employed in future years, and the design proposed here lends itself to the identification of useful strata for future use.

2 The Concept of Poststratification

Sampling plans having fixed strata for both the sample design and estimation in a survey are generally used in situations for which population units within the population may be classified into relatively homogeneous groups (i.e., strata), where homogeneous means with respect to the response of interest. If the variance in responses is smaller within strata than between strata, it is often possible to realize an increase in efficiency of a population-level estimator relative to that of a simple random sample; efficiency here refers to the mean squared error or variance of estimators, which are equal under unbiased estimation. In some situations, however, it is difficult or undesirable to designate strata at the sample design phase, even though the use of stratified estimation procedures may be appropriate. For example, strata definitions may be readily available, but obtaining a sample using some other plan, such as simple random sampling, may be less costly or more easily accomplished. A similar situation arises when a survey includes multiple responses of interest, and a single stratified sample design may not be appropriate for all of the responses. In such situations the typical statistical approach to estimation is called *poststratification*. The essence of poststratification is to classify sampled units into strata classes *after* the sample is collected, then perform estimation as if these strata had been used to design the sampling procedure in the first place. While this is certainly the concept behind poststratification, there are some differences with a fixed stratification procedure that should not be ignored.

The fundamental difference between a fixed stratification scheme and the use of poststratification is that, in the former, the size of samples taken from various strata are fixed prior to selection of a sample while, in the latter, the size of samples within (post) strata are random quantities. This leads to differences in the variance of estimators of population quantities under fixed stratified and poststratified estimation procedures. There are two of these differences that deserve mention here. First, the variance of poststratified estimators includes a source of variability, due to the fact that sample sizes within strata are random, that is not present in fixed stratification schemes. This source of variability is often ignored in poststratified estimation, which is then conducted *conditionally* on the realized strata sample sizes (e.g., Thompson, 1992; page 109). The second difference is more subtle and, perhaps, more important. In a fixed stratification scheme, independent estimates are available for individual strata, and these estimates may then be simply combined to population-level estimates. In poststratification, however, estimates of strata-level quantities (e.g., totals or means) are typically not independent among strata and, thus, are not easily combined to the population level. Two types of estimators are proposed in this report, one that provides unbiased estimates of poststrata totals, means, and their variances, and the other that provides more efficient estimates at the level of the entire population.

Poststratification estimators are most commonly presented in the sampling literature under the assumption that the sample (sometimes called the *parent* sample) is obtained through a simple random sampling design. This assumption is appropriate for situations in which obtaining a sample drawn from fixed strata is logistically difficult relative to obtaining a sample from a simple random sampling design. The problem considered here, however, is somewhat different in that it is not implementation of a sampling design that is problematic but, rather, the identification of appropriate strata from a number of possibilities. In addition, given the focus of

the survey on the fixed and variable costs of shrimping, it is desirable to draw an initial sample that ensures reasonable coverage of the entire fleet relative to characteristics that might be connected to costs. Thus, what is recommended in this report is the use of poststratification estimators combined with a structured initial sampling design. This renders the resulting statistical estimators somewhat more complex than what is typically found in elementary sampling texts (e.g., Thompson, 1992). It is the intent of this report to give sufficient detail to allow the estimation strategy recommended to be readily understood, but (hopefully) without belaboring well-known results from elementary theory.

3 Fundamental Approach and Notation

The statistical approach adopted in this report is one in which probability is generated only through the sampling mechanism. That is, responses on observed population units are not interpreted as realizations of random variables but, rather, as fixed characteristics of those units. Thus, in the notation that follows, y_k represents a non-random characteristic of the k th unit of the population, the response of the k th unit. The population is taken to consist of a total of N units; in this report we have $N = 1,207$. Probability is applied to the chances that units of the population are included in a sample. This probability will be represented in terms of *indicator* variables,

$$I(k \in \mathcal{S}) = \begin{cases} 1 & \text{if unit } k \text{ is in sample } \mathcal{S} \\ 0 & \text{otherwise.} \end{cases}$$

Using this notation, the indicator variables $\{I(k \in \mathcal{S})\}$ are binary random quantities with expected value equal to the probability that the k th unit is selected for the sample,

$$E\{I(k \in \mathcal{S})\} = \pi_k. \tag{1}$$

In this notation, the quantities $\{\pi_k; k = 1, \dots, N\}$ are called the *inclusion probabilities* for the population units.

Under the assumption that a sample of size n is to be drawn without replacement, so that a unit may not appear more than once in the sample, the inclusion probabilities are not independent. In particular, the probability that two particular units, k and j say, are both included in the sample is not equal to the product $\pi_k \pi_j$. For this reason we define the *second order inclusion probabilities* as,

$$E\{I(k \in \mathcal{S}) I(j \in \mathcal{S})\} = \pi_{k,j}. \quad (2)$$

The second order inclusion probabilities will become important in determining the variances associated with possible estimators.

The sample is to be drawn from the entire population U as a stratified sample, where the strata will be defined as groups of population units that are denoted with the subscript h ; $h = 1, \dots, H$. That is, U_h will denote the *hth sampling stratum*, $U_h \equiv \{k : k \in \text{stratum } h\}$, the set of units in the population that fall into the *hth* group, N_h will denote the number of population units in the *hth* sampling stratum, \mathcal{S}_h the sample from the *hth* sampling stratum, n_h the number of units in the sample from the *hth* sampling stratum, and so forth. Thus, the summation

$$\sum_{k \in \mathcal{S}_h} y_k$$

denotes the sum of the responses y_k over the units that are selected for the sample from the *hth* sampling stratum.

For estimation under a given poststratification scheme, we will let U_g ; $g = 1, \dots, G$ denote the *analysis strata*. Subscripting for these strata will follow the same conventions as for the sample strata described immediately above. Note that both the sampling strata $\{U_h : h = 1, \dots, H\}$ and the analysis strata $\{U_g : g = 1, \dots, G\}$ constitute partitions of the population, but partitions that may overlap in a complex manner. For example, the *2nd* analysis stratum may be composed of parts of

the 1st, 3rd, and 5th sampling strata. This requires double subscripting of various quantities such as $U_{g,h}$ for the set of units in the g th analysis stratum that are also in the h th sampling stratum, $N_{g,h}$ for the number of such units, $\mathcal{S}_{g,h}$ for the set of sampled units in the g th analysis stratum and h th sampling stratum, $n_{g,h}$ for the number of such units, and so forth. An important mechanism that will be used repeatedly is that, for any quantity associated with population units, x_k say,

$$\sum_{k \in U_g} x_k = \sum_{h=1}^H \sum_{k \in U_{g,h}} x_k.$$

It is assumed that the objective is to estimate either the total or mean of a given response in the population, and these will be denoted as τ and μ , respectively. That is,

$$\begin{aligned} \tau &\equiv \sum_{k \in U} y_k, \\ \mu &\equiv \frac{1}{N} \sum_{k \in U} y_k. \end{aligned}$$

4 Drawing a Comprehensive Sample

An extensive exploratory analysis was conducted using data provided by NMFS that contained values for tonnage, length, and age of vessels registered by the US Coast Guard, total gulf shrimp pounds landed (2001) and gross revenue (2001) for these same vessels. Summary statistics, marginal histograms, and other quantities were examined for these variables. A complete presentation and discussion of this exploratory work would render this report untimely and is thus not presented here. Two figures resulting from these analyses bear presentation. Figure 1 presents a scatterplot matrix of the variables mentioned above for the entire set of 1,207 vessels (except for plots that involve age of vessel for which there are only 1,205 vessels represented due to missing values for age). It is evident that, aside from ton-

nage versus length and landed pounds versus gross revenue, relations among these variables are weak. In particular, the scatterplot of total pounds of landed shrimp versus vessel tonnage (fourth row down from the top in the first column of Figure 1) demonstrates that large size of vessel is perhaps necessary for a high level of shrimp catch, but is not sufficient for the same. The relation between total landed pounds and gross revenue (both for 2001) is particularly interesting, and a larger perspective of this relation is shown in the scatterplot of Figure 2. In Figure 2 it can be seen that, while there is a strong linear relation between these variables, which might be expected, there are also more vessels that appear to have a smaller gross revenue than the bulk of the fleet that landed a comparable number of pounds of shrimp than there are vessels that obtained a larger gross revenue than the bulk of the comparable fleet. Identification of the data points that corresponded to vessels having particular primary ports did not reveal any identifiable patterns relative to this scatterplot (i.e., all of the “low” points did not correspond to one or a few particular ports). Nevertheless, this interesting relation led to the idea that vessels might be stratified, for sampling purposes, based on whether they realized above average revenue for the total shrimp landed or below average revenue for the total shrimp landed, where average refers to the entire fleet.

Two additional factors were identified as primary candidates to define sampling strata, those being vessel tonnage and primary port. Vessels in the fleet range from 5 to 232 tons, and geographic location of primary port may reasonably be related to level of variable costs, such as the price of fuel and ice. While there is no numerical evidence that either of these factors is related to the response variables of interest in a survey of socioeconomic characteristics of the fleet, they seem to represent the most easily identifiable categories that might be claimed as “under-represented” if one was not pleased with the results of the survey to be conducted.

The recommended sampling stratification consists of 12 ports, two vessel sizes

(based on tonnage), and two “economic return” categories (above and below average for the given total landings), for a total of 48 sampling strata. Vessel size was defined as “small” if tonnage was less than 100 and “large” if tonnage was greater than 100, these values based on the marginal histogram for tonnage of all vessels in the fleet. Ports 71 (Chambers County), 83 (Port Lavaca), 84 (Harris County), and 86 (Matagorda County) had all four sub-categories collapsed into one due to small numbers of vessels with these as primary ports, and port 72 (Galveston) had small and large vessels for larger than average economic return collapsed into one category for the same reason. This results in a total of 34 sampling strata, which are indexed and identified in Table 1. The division of “economic return” as + and – was based on positive and negative residuals from an ordinary least squares fit of gross revenue to total pounds of shrimp landed.

It is suggested that the sampling plan be that of a stratified random sample using proportional allocation with the 34 sampling strata identified. Since the total number of population units is $N = 1,207$, a sample of 10% of the population is $n = 121$. Allocations proportional to population size in the strata N_h yields the fixed sample sizes n_h listed in Table 1. Also given in Table 1 are the inclusion probabilities from equation (1) and the second-order inclusion probabilities from equation (2). Using simple random sampling within each of the 34 strata presented in Table 1, the inclusion probabilities are computed, for $k \in U_h$, as

$$\pi_k = \frac{(N_h - 1)!}{(n_h - 1)! ((N_h - 1) - (n_h - 1))!} = \frac{n_h}{N_h},$$

while the second-order inclusion probabilities are computed for $k, j \in U_h$; $k \neq j$, as

$$\pi_{k,j} = \frac{(N_h - 2)!}{(n_h - 2)! ((N_h - 2) - (n_h - 2))!} = \frac{n_h(n_h - 1)}{N_h(N_h - 1)}.$$

Table 1. Definition of Sampling Strata

Statum id (h)	Port	Economic Return	Size	N_h	n_h	π_k	$\pi_{k,j}$
1	70	+	Small	12	1	0.0833	0.0000
2	70	+	Large	103	10	0.0971	0.0086
3	70	−	Small	77	8	0.1039	0.0096
4	70	−	Large	52	5	0.0962	0.0075
5	71	All	All	10	1	0.1000	0.0000
6	72	+	All	19	2	0.1053	0.0058
7	72	−	All	24	2	0.0833	0.0036
8	73	+	Small	8	1	0.1250	0.0000
9	73	+	Large	20	2	0.1000	0.0053
10	73	−	Small	32	3	0.0938	0.0060
11	73	−	Large	54	5	0.0926	0.0070
12	78	+	Small	24	2	0.0833	0.0036
13	78	+	Large	23	2	0.0870	0.0039
14	78	−	Small	42	4	0.0954	0.0070
15	78	−	Large	9	1	0.1111	0.0000
16	81	+	Small	25	3	0.1200	0.0100
17	81	+	Large	51	5	0.0980	0.0078
18	81	−	Small	35	4	0.1143	0.0101
19	81	−	Large	37	4	0.1081	0.0090
20	82	+	Small	29	3	0.1034	0.0074
21	82	+	Large	105	11	0.1048	0.0101
22	82	−	Small	28	3	0.1071	0.0079
23	82	−	Large	34	3	0.0882	0.0053
24	83	All	All	23	2	0.0870	0.0040
25	84	All	All	12	1	0.0833	0.0000

Table 1 (cont.)

26	85	+	Small	11	1	0.0909	0.0000
27	85	+	Large	13	1	0.0769	0.0000
28	85	–	Small	75	8	0.1067	0.0101
29	85	–	Large	38	4	0.1053	0.0085
30	86	All	All	17	2	0.1176	0.0074
31	87	+	Small	16	2	0.1250	0.0083
32	87	+	Large	69	7	0.1014	0.0090
33	87	–	Small	27	3	0.1111	0.0085
34	87	–	Large	53	5	0.0943	0.0073
TOTAL	ALL	ALL	ALL	1207	121		

To draw a stratified random sample according to the prescription of Table 1, a simple random sample of size n_h is taken from each of the 34 strata. A file giving classification of vessels into these strata is available, but is not presented here for reasons of confidentiality.

5 Estimation

Two types of estimators for totals and mean responses are presented in this section. Both depend heavily on the inclusion and second-order inclusion probabilities presented in Table 1 for the suggested sampling design of Section 4. The estimators presented in Section 5.1 are known as Horvitz-Thompson estimators. They provide unbiased estimates for any set of groups, but are difficult to combine to the population level in this situation, because estimates of the group variances are not independent under poststratification. It is recommended that these estimators be used to examine individual sectors (groups) of the fleet, those sectors corresponding

to various poststrata. This should provide information about the relative homogeneity of groups that might be used as strata in the future. The estimators presented in Section 5.2 are derived from what are known as regression estimators. These estimators are not unbiased, but are generally felt to possess smaller mean squared (or total) error than the corresponding Horvitz-Thompson estimators. It is recommended that these estimators be used to examine quantities at the level of the total fleet under various poststratification schemes.

Given the definitions of π_k and $\pi_{k,j}$ in equations (1) and (2), respectively, we have that

$$\begin{aligned} \text{var}\{I(k \in \mathcal{S})\} &= \pi_k(1 - \pi_k); \quad k \in U \\ \text{cov}\{I(k \in \mathcal{S}), I(j \in \mathcal{S})\} &= \pi_{k,j} - \pi_k\pi_j; \quad k, j \in U; \quad k \neq j \end{aligned}$$

Recall in what follows that $h = 1, \dots, H$ is used to index the sampling strata, while $g = 1, \dots, G$ is used to index the analysis strata, or poststrata.

5.1 The Horvitz-Thompson Estimator

A well-known result from the theory of survey sampling is that, for any population (or group within a population), an unbiased estimator of the total response is the standard Horvitz-Thompson estimator,

$$\hat{\tau} = \sum_{k \in \mathcal{S}} \frac{y_k}{\pi_k}. \quad (3)$$

The proof of unbiasedness for this estimator is given here to illustrate a technique that will be used repeatedly in subsequent results. Note that, using the indicator variable notation, from Section 2, we can write (3) as

$$\hat{\tau} = \sum_{k \in U} \frac{y_k}{\pi_k} I(k \in \mathcal{S}).$$

Then,

$$\begin{aligned}
 E\{\hat{\tau}\} &= E\left\{\sum_{k \in U} \frac{y_k}{\pi_k} I(k \in \mathcal{S})\right\} \\
 &= \sum_{k \in U} \frac{y_k}{\pi_k} E\{I(k \in \mathcal{S})\} \\
 &= \sum_{k \in U} \frac{y_k}{\pi_k} \pi_k = \sum_{k \in U} y_k = \tau
 \end{aligned}$$

Since the above result holds for any arbitrary group of population units, we may apply the Horvitz-Thompson estimator to poststratification groups. To do this requires the recognition that not all π_k are identical for a given level of the group indicator g . That is,

$$\hat{\tau}_g = \sum_{k \in \mathcal{S}_g} \frac{y_k}{\pi_k} = \sum_{h=1}^H \sum_{k \in \mathcal{S}_{g,h}} \frac{y_k}{\pi_k} = \sum_{h=1}^H \sum_{k \in \mathcal{S}_{g,h}} \frac{y_k N_h}{n_h}. \quad (4)$$

That $\hat{\tau}_g$ is unbiased for τ_g follows from the fact that unbiasedness of $\hat{\tau}$ in (3) holds for any group, or may be shown directly using the same method applied to $\hat{\tau}$ above. Note that $\hat{\tau}_g$ may be written as,

$$\hat{\tau}_g = \sum_{k \in U_g} \frac{y_k}{\pi_k} I(k \in \mathcal{S}_g) = \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k N_h}{n_h} I(k \in \mathcal{S}_{g,h}).$$

Then,

$$\begin{aligned}
 E\{\hat{\tau}_g\} &= E\left\{\sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k N_h}{n_h} I(k \in \mathcal{S}_{g,h})\right\} \\
 &= \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k N_h}{n_h} E\{I(k \in \mathcal{S}_{g,h})\} \\
 &= \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k N_h}{n_h} \frac{n_h}{N_h} = \sum_{h=1}^H \sum_{k \in U_{g,h}} y_k = \tau_g.
 \end{aligned}$$

The variance of $\hat{\tau}_g$ in (4) is derived as,

$$\begin{aligned}
\text{var}\{\hat{\tau}_g\} &= \text{var}\left\{\sum_{k \in U_g} \frac{y_k}{\pi_k} I(k \in \mathcal{S}_g)\right\} \\
&= \sum_{k \in U_g} \frac{y_k^2}{\pi_k^2} \text{var}\{I(k \in \mathcal{S}_g)\} + \sum_{k,j \in U_g; k \neq j} \frac{y_k y_j}{\pi_k \pi_j} \text{cov}\{I(k \in \mathcal{S}_g), I(j \in \mathcal{S}_g)\} \\
&= \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k^2}{\pi_k^2} \text{var}\{I(k \in \mathcal{S}_{g,h})\} + \sum_{h=1}^H \sum_{k,j \in U_{g,h}; k \neq j} \frac{y_k y_j}{\pi_k \pi_j} \text{cov}\{I(k \in \mathcal{S}_{g,h}), I(j \in \mathcal{S}_{g,h})\},
\end{aligned}$$

where the last line follows because any two population units k and j that are not in the same sampling stratum h have second-order inclusion probability $\pi_{k,j} = \pi_k \pi_j$, and then $\text{cov}\{I(k \in \mathcal{S})\}, I(j \in \mathcal{S})\} = 0$. Then,

$$\begin{aligned}
\text{var}\{\hat{\tau}_g\} &= \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k^2}{\pi_k^2} \text{var}\{I(k \in \mathcal{S}_{g,h})\} + \sum_{h=1}^H \sum_{k,j \in U_{g,h}; k \neq j} \frac{y_k y_j}{\pi_k \pi_j} \text{cov}\{I(k \in \mathcal{S}_{g,h}), I(j \in \mathcal{S}_{g,h})\} \\
&= \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k^2}{\pi_k^2} \pi_k (1 - \pi_k) + \sum_{h=1}^H \sum_{k,j \in U_{g,h}; k \neq j} \frac{y_k y_j}{\pi_k \pi_j} (\pi_{k,j} - \pi_k \pi_j) \\
&= \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k^2 N_h^2}{n_h^2} \frac{n_h}{N_h} \left(1 - \frac{n_h}{N_h}\right) + \sum_{h=1}^H \sum_{k,j \in U_{g,h}; k \neq j} \frac{y_k y_j N_h^2}{n_h^2} \left\{ \frac{n_h(n_h - 1)}{N_h(N_h - 1)} - \frac{n_h^2}{N_h^2} \right\} \\
&= \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k^2 N_h}{n_h} \left(1 - \frac{n_h}{N_h}\right) + \sum_{h=1}^H \sum_{k,j \in U_{g,h}; k \neq j} y_k y_j \left\{ \frac{N_h(n_h - 1)}{(N_h - 1)n_h} - 1 \right\} \\
&= \sum_{h=1}^H \left(\frac{N_h - n_h}{n_h} \right) \sum_{k \in U_{g,h}} y_k + \sum_{h=1}^H \left(\frac{n_h - N_h}{n_h(N_h - 1)} \right) \sum_{k,j \in U_{g,h}; k \neq j} y_k y_j. \tag{5}
\end{aligned}$$

An unbiased estimator of $\text{var}\{\hat{\tau}_g\}$ is obtained as,

$$\begin{aligned}
\hat{V}\{\hat{\tau}_g\} &= \sum_{h=1}^H \left(\frac{N_h - n_h}{n_h} \right) \sum_{k \in S_{g,h}} \frac{y_k N_h}{n_h} + \sum_{h=1}^H \left(\frac{n_h - N_h}{n_h(N_h - 1)} \right) \sum_{k,j \in S_{g,h}; k \neq j} \frac{y_k y_j N_h(N_h - 1)}{n_h(n_h - 1)} \\
&= \sum_{h=1}^H \left(\frac{(N_h - n_h)N_h}{n_h^2} \right) \sum_{k \in S_{g,h}} y_k + \sum_{h=1}^H \left(\frac{(n_h - N_h)N_h}{n_h^2(n_h - 1)} \right) \sum_{k,j \in S_{g,h}; k \neq j} y_k y_j, \tag{6}
\end{aligned}$$

that is, by substituting into (5) unbiased estimators of the two quantities

$$\sum_{k \in U_{g,h}} y_k \quad \text{and} \quad \sum_{k,j \in U_{g,h}; k \neq j} y_k y_j.$$

For estimation of postrata means, we make use of the fact that $\tau_g = N_g \mu_g$. To estimate the mean response, rather than the total, for group g , divide $\hat{\tau}_g$ in equation (4) by the known group size N_g , that is, $\hat{\mu}_g = \hat{\tau}_g / N_g$. The variance and estimated variance of $\hat{\mu}_g$ are computed by dividing equations (5) and (6) by N_g^2 , that is, $\text{var}\{\hat{\mu}_g\} = \text{var}\{\hat{\tau}_g\} / N_g^2$ and $\hat{V}\{\hat{\mu}_g\} = \hat{V}\{\hat{\tau}_g\} / N_g^2$.

5.2 Regression Estimator

Development of the general regression estimator under poststratification for the case in which the sample is itself selected from a stratified sampling plan is not as straightforward as the simple calculations connected with the Horvitz-Thompson estimators of Section 5.1. A complete development may be found in Sarndal, Swenson and Wretman, 1992, particularly Chapters 6 and 7. Using the same notation as in previous sections, a regression estimator of the population total may be written as,

$$\begin{aligned} \hat{\tau} &= \sum_{g=1}^G N_g \frac{\sum_{k \in \mathcal{S}_g} y_k / \pi_k}{\sum_{k \in \mathcal{S}_g} 1 / \pi_k} \\ &= \sum_{g=1}^G N_g \frac{\sum_{h=1}^H \sum_{k \in \mathcal{S}_{g,h}} (y_k N_h) / n_h}{\sum_{h=1}^H \sum_{k \in \mathcal{S}_{g,h}} (n_{g,h} N_h) / n_h}. \end{aligned} \quad (7)$$

The variance and estimated variance for $\hat{\tau}$ from (7) is perhaps presented most easily by noting that

$$\hat{\tau} = \sum_{g=1}^G N_g \frac{\sum_{h=1}^H \hat{\tau}_{g,h}}{\sum_{h=1}^H \hat{N}_{g,h}} = \sum_{g=1}^G N_g \frac{\hat{\tau}_g}{\hat{N}_g}, \quad (8)$$

where,

$$\hat{\tau}_{g,h} = \sum_{k \in \mathcal{S}_{g,h}} \frac{y_k}{\pi_k} = \sum_{k \in \mathcal{S}_{g,h}} \frac{y_k N_h}{n_h},$$

and

$$\hat{N}_{g,h} = \sum_{k \in \mathcal{S}_{g,h}} \frac{1}{\pi_k} = \sum_{k \in \mathcal{S}_{g,h}} \frac{N_h}{n_h}.$$

Using this notation, a first-order Taylor's series approximation to $\hat{\tau}$, and derivation of the variances for components in this linearization (see Wolter, 1985) yields,

$$var\{\hat{\tau}\} \approx$$

$$\sum_{g=1}^G \sum_{k \in U_g} \pi_k (1 - \pi_k) \frac{(y_k - \tau_g/N_g)^2}{\pi_k^2} + \sum_{g=1}^G \sum_{g'=1}^G \sum_{k \in U_g; j \in U_{g'}; k \neq j} (\pi_{k,j} - \pi_k \pi_j) \left(\frac{y_k - \tau_g}{\pi_k} \right) \left(\frac{y_j - \tau_{g'}}{\pi_j} \right). \quad (9)$$

This approximate variance may be estimated by substitution of the estimators $\hat{\tau}_g$ and \hat{N}_g appearing in expression (8) for the corresponding quantities τ_g and N_g in (9). The expressions for $var\{\hat{\tau}\}$ and its estimated value can be further expressed in terms of N_h and n_h as has been shown previously for other estimators, but this is not shown in the current report.

6 Non-Response and Voluntary Responses

It is anticipated that both non-response and voluntary responses will occur in the planned survey of shrimp fishermen in the gulf. Suggested strategies for dealing with these potential difficulties are stated briefly here. Non-response refers to vessels selected for the sample that refuse to give information. Voluntary response refers to individuals who provide information even though their vessel was not selected for the sample.

1. Non-Response.

Although any number of statistical approaches might be applied to missing

responses, such as adjustment of estimators, hot-deck imputation, or multiple imputation, development of these approaches is beyond the scope of the current project. An alternative, which might be justified for this survey, would be to simply remove units from the population of interest if those units refuse to provide information. This might require re-computation of inclusion probabilities after it is known how many sampled vessels have refused to cooperate, but otherwise provides no additional difficulties for the methodology proposed in this report.

2. Voluntary Responses.

Voluntary responses are easily incorporated into the estimators proposed in this report by setting inclusion probabilities equal to one. That is, for any vessel w represented by submission of an unsolicited response to the survey, $\pi_w \equiv 1$. Second-order inclusion probabilities involving vessel w are computed using independence among voluntary responses and solicited responses (i.e., sampled vessels) as $\pi_{w,j} = \pi_w \pi_j$ for any $j \neq w$. Such responses may then be directly incorporated into all of the estimators presented in previous sections.

References

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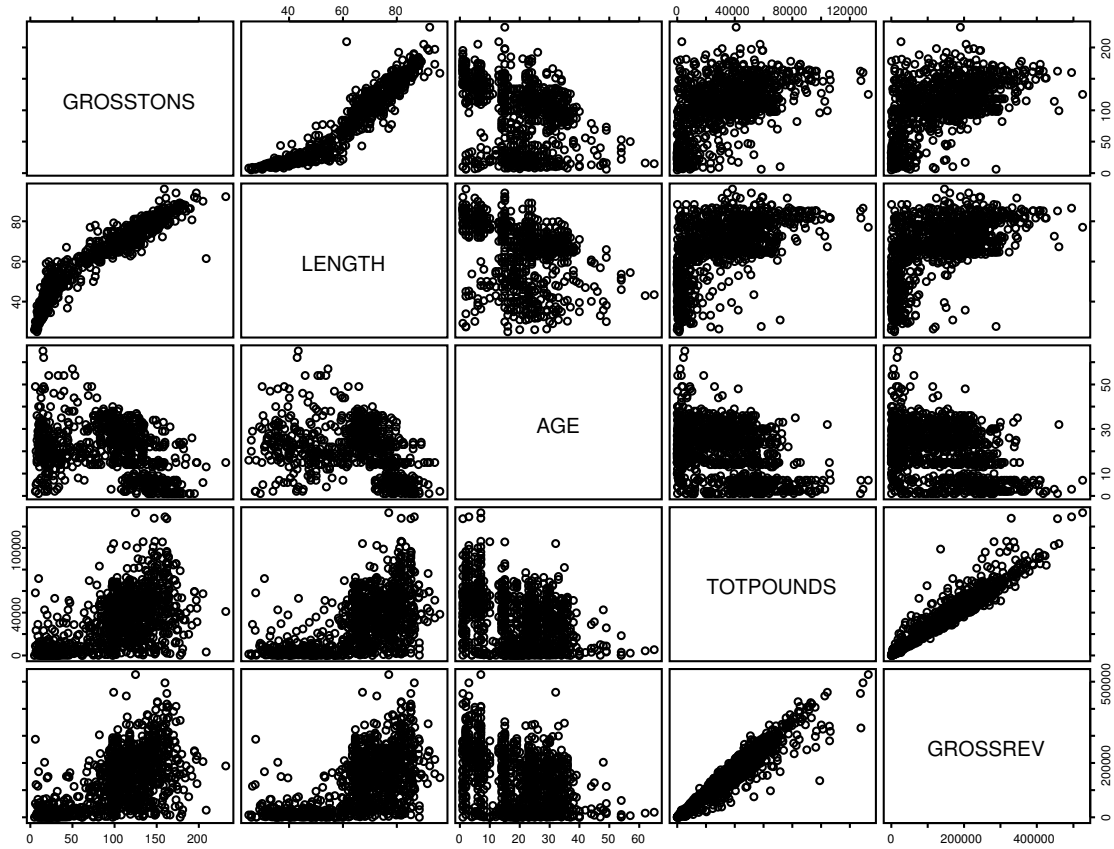


Figure 1. Scatterplot matrix of variables included in the vessel characteristics data provided by NMFS.

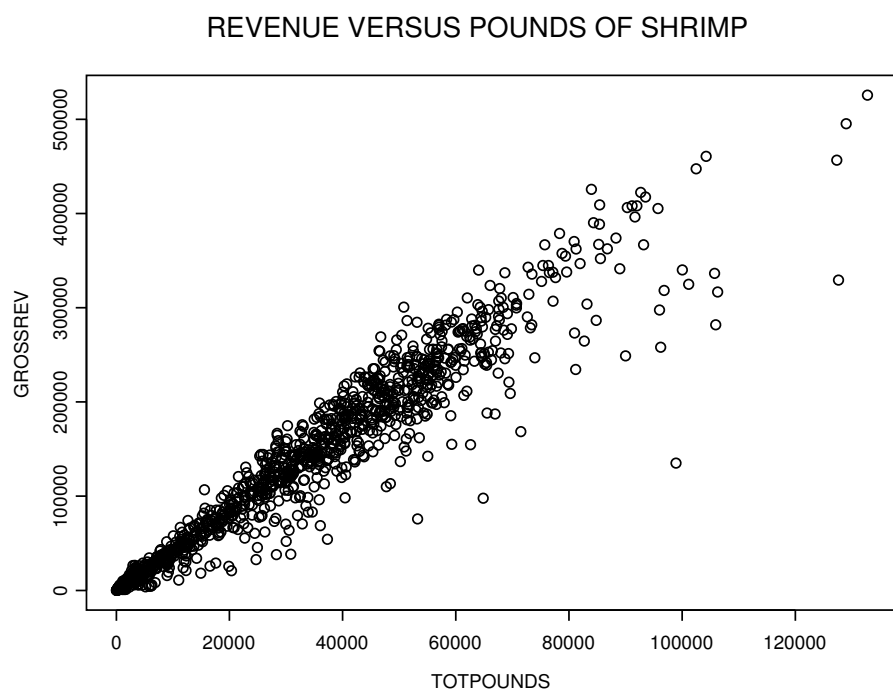


Figure 2. Scatterplot of gross revenue for vessels versus total pounds of shrimp landed.
Both numbers are for 2001.

Addendum to Development of a Sampling Plan for
Socioeconomic Survey of Offshore Gulf Shrimp
Fishermen:
Production of Random Samples and Adjustments
for Nonresponse

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February 2003

1 Introduction

This report has been prepared for the Marine Resources Assessment Group, Americas (MRAG), as part of a project on the design of a survey of shrimp fishermen on the Gulf Coast. A previous report described a sampling and analysis plan for this project that relied on a highly stratified sampling design combined with the use of *post-stratification* for estimation of quantities of interest in the population. After the sample has been selected, the stratification used in its production is ignored, resulting in what can be considered simply an unequal probability sample across the population. The individual *inclusion probabilities* that result play a key role in any subsequent analyses.

Two inter-related issues, mentioned only briefly in the previous report, seem to have caused some confusion, and the purpose of this addendum is to clarify these issues. The subjects of concern may be described as *sequential versus group sample selection* and *adjustment for nonresponse*. Briefly, one recommendation given in the previous report was that, given a properly constructed sampling list, samples of any desired size could be selected and, in particular, sample size could be increased at any time, simply by selecting additional units from the list. This prescription may have been misinterpreted at some level within NMFS or OMB. In addition, it was suggested that one potential mechanism for dealing with the difficult problem of nonresponse would be to “re-define” the population of interest as excluding units who refused to respond. This was suggested as a simple and practical approach to avoid the potential deleterious effects of nonresponse bias, but would require a re-computation of inclusion probabilities for units that did respond. The approach is not entirely satisfactory because it leaves units in the population that would have refused to respond had they been chosen for the sample. In addition, it appears that NMFS is either unwilling or unable under regulations to re-define the population

in this manner. Thus, some type of adjustment is necessary to account for non-response. These two issues are inter-related because the desire to increase sample size is directly related to the number of non-responses encountered in an original sample.

2 Equivalence of Sequential and Group Sampling

This section demonstrates the equivalence of group and sequential sampling methods for selecting a simple random sample of size n from a population of size N . Since the sampling plan proposed in the earlier report involves selection of a simple random sample from a number of groups or “sampling strata”, this result is directly applicable to that situation.

Consider the process of selecting a simple random sample of n units from a population that contains N units. By definition, this implies that each possible sample of size n has the same probability of being selected. Denote a possible sample of size n as $S_{n,k}$. The number of such possible samples is $N!/[(N-n)!n!]$ and,

$$Pr(S_{n,k}) = \frac{(N-n)!n!}{N!}; \quad k = 1, \dots, \frac{N!}{(N-n)!n!}. \quad (1)$$

Another way to characterize a simple random sample is in terms of the inclusion probabilities for individual population units. Let $\{U_h : h = 1, \dots, N\}$ denote the population units. The number of possible samples that contain unit U_h is equal to the number of samples of size $n-1$ that can be formed from the other $N-1$ population units. Then simple random sampling implies that the probability unit U_h is included in a sample of size n , S_n say, is given as the number of possible

samples that contain unit U_h divided by the total number of possible samples,

$$\begin{aligned}
 Pr(U_h \in S_n) &= \frac{\left\{ \frac{(N-1)!}{(N-1-(n-1))! (n-1)!} \right\}}{\left\{ \frac{N!}{(N-n)! n!} \right\}} \\
 &= \frac{(N-1)! (N-n)! n!}{N! (N-n)! (n-1)!} \\
 &= \frac{n}{N}.
 \end{aligned} \tag{2}$$

The probabilities in (1) and (2) are *equivalent*, that is, either characterizes a simple random sample of size n drawn from a population of size N .

Now consider the physical (or computational) process of selecting a random sample. There are several ways in which this may be accomplished. First, the units in a population are arbitrarily ordered with labels $1, \dots, N$. How these labels are assigned is completely irrelevant so long as each unit has a distinct label. A *group* selection procedure then consists of enumeration of each of the possible samples of size n and selecting one of these samples at random. For example, if $N = 6$ and $n = 2$, the possible samples could be enumerated as,

Sample	Unit Composition	Sample	Unit Composition
1	$\{U_1, U_2\}$	9	$\{U_2, U_6\}$
2	$\{U_1, U_3\}$	10	$\{U_3, U_4\}$
3	$\{U_1, U_4\}$	11	$\{U_3, U_5\}$
4	$\{U_1, U_5\}$	12	$\{U_3, U_6\}$
5	$\{U_1, U_6\}$	13	$\{U_4, U_5\}$
6	$\{U_2, U_3\}$	14	$\{U_4, U_6\}$
7	$\{U_2, U_4\}$	15	$\{U_5, U_6\}$
8	$\{U_2, U_5\}$		

A random sample of size 2 would then be selected by choosing one integer from 1 to 15 at random, and the associated sample. By the equivalence of (1) and (2), the probability that a population unit U_h was selected for the sample would be n/N or here $2/6$. This is easily verified numerically for the present example from the number of times each unit appears in the list of 15 possible samples, which is 5; $5/15 = 2/6$.

An alternative procedure by which to select a sample is through the use of sequential sampling. To produce a sample of size n under this procedure, n steps are carried out as follows:

Step	Action
1	Select 1 unit at random from population of size N
2	Select 1 unit at random from remaining population of size $N - 1$
3	Select 1 unit at random from remaining population of size $N - 2$
\vdots	\vdots
n	Select 1 unit at random from remaining population of size $N - (n - 1)$

Consider a particular population unit U_h . Let $E_{1,h}$ denote the event that U_h is selected for the sample in the first step of the sequential procedure. Let $E_{2,h}$ denote the event that U_h is selected in the second step of the procedure, and similarly for $E_{3,h}, \dots, E_{n,h}$. The probability that unit U_h is selected for the sample is the probability of the union of the events $E_{1,h}$ through $E_{n,h}$. That is,

$$Pr(U_h \in S_n) = Pr(E_{1,h} \cup E_{2,h} \cup \dots \cup E_{n,h}).$$

Since the events $E_{1,h}, \dots, E_{n,h}$ are mutually exclusive, the axioms of probability give that,

$$Pr(U_h \in S_n) = \sum_{i=1}^n Pr(E_{i,h}). \quad (3)$$

Now, $Pr(E_{1,h}) = 1/N$ and, for $i = 2, \dots, n$,

$$Pr(E_{i,h}) = Pr(E_{1,h}^c \cap \dots \cap E_{i-1,h}^c) \frac{1}{N - (i - 1)},$$

where $E_{j,h}^c$ denotes the complement of $E_{j,h}$, that is, the event that unit U_h is not selected at step j of the sampling procedure. Independence of the events $E_{j,h}$ implies independence of the events $E_{j,h}^c$ so that,

$$Pr(E_{i,h}) = \left\{ \prod_{j < i} Pr(E_{j,h}^c) \right\} \frac{1}{N - (i - 1)}. \quad (4)$$

We have that $Pr(E_{j,h}^c) = (N - j)/(N - (j - 1))$, and, for $i = 2, \dots, n$,

$$\begin{aligned} Pr(E_{i,h}) &= \left\{ \prod_{j < i} \frac{N - j}{N - (j - 1)} \right\} \frac{1}{N - (i - 1)} \\ &= \frac{1}{N}. \end{aligned} \quad (5)$$

For example, if $i = 5$ and $5 < N$, equation (5) would give

$$\begin{aligned} Pr(E_{5,h}) &= \left\{ \prod_{j < 5} \frac{N - j}{N - (j - 1)} \right\} \frac{1}{N - (5 - 1)} \\ &= \frac{N - 1}{N} \frac{N - 2}{N - 1} \frac{N - 3}{N - 2} \frac{N - 4}{N - 3} \frac{1}{N - 4} \\ &= \frac{1}{N} \end{aligned}$$

Finally, substituting $Pr(E_{1,h}) = 1/N$ and (5) into (3) gives,

$$Pr(U_h \in S_n) = \sum_{i=1}^n \frac{1}{N} = \frac{n}{N}, \quad (6)$$

which, by (2) is the same inclusion probability that would be obtained by the group sampling procedure. Thus, the group procedure and the sequential procedure are equivalent.

The benefits of the sequential procedure are that it is amenable to formulation of computational algorithms for random sampling and that it does not depend on a

fixed sample size n being available prior to formation of the sampling list. It is, in fact, directly analogous to the physical process that one would conduct to draw n numbered balls without replacement from a box containing N such balls. What is, perhaps, less obvious is that this procedure can be used to develop a sampling list of all N units in the population. To obtain a random sample of n units one simply takes the first n units in the list. And, if it is later determined that a sample of size $n + m$ (for non-negative integer m) is desired, one merely adds the next m units from the list into the sample.

The ramification of this for the present problem is that there is no need to determine a necessary original sample size to obtain a given number of responses, under a guess that a certain percentage of the originally sampled units will respond. With a complete sampling list in hand and a desired sample size of 120, say, one would simply sample the first 120 units in the list. If only 100 of those units responded, then the next 20 units would be sampled. If only 15 of those units responded then the next 5 units would be sampled, and so forth, until a total of 120 responses were obtained. This is, of course, only a *sampling plan*. It does not solve the difficulty of how to deal with selected units that result in a nonresponse.

3 Adjustment for Nonresponse

Statistical properties of basic survey sampling estimators are typically derived under the assumption that a response is obtained from every population unit selected for a given sample. This is often not the case, and there are a variety of strategies to deal with the issue of nonresponse in sampled units. The simplest strategy is to ignore nonresponse, using the number of sampled units with response as the sample size n . For example, if a sample of size of 120 was planned, but only 118

of those units responded, one might take the selected sample size to be $n = 118$ and employ the usual formulae derived under the assumption of complete response for sampled units. Alternatively, if a sample of 120 was planned, but only 118 responses were realized, one might employ the sequential sampling plan to extend the sample until 120 responses were obtained and then use $n = 120$ in the usual estimators. Either of these strategies may very well be reasonable in cases for which the number of nonresponses is a small proportion of the sampled units. Formal definition of “reasonable” and “small” are beyond the scope of the present report, but should fall within the range of intuition for our purposes; a basic criterion would be whether estimates derived under an assumption of complete response are meaningfully different from analogous estimates that are adjusted for nonresponse; this is, of course, not known. If the level of nonresponse is more than a small proportion of the planned sample size, however, this strategy is not reliable. For example, if a sample of size 180 was drawn, from which 120 responses were realized, use of the standard estimation formulae using $n = 120$ could not be justified, and would almost certainly lead to more unreliable results than the prescription to re-define the population of interest based on response, which was made in the previous report. Thus, if NMFS is unwilling or unable to re-define the population being sampled, some type of adjustment for nonresponse is necessary.

In the present problem, little is known about either the level of nonresponse that will occur or the potential bias that nonresponse might introduce in estimates of population quantities (e.g., totals or means). There are no magic analytical procedures that can completely resolve this difficulty. To approach this problem in the current situation, it may be helpful to distinguish between what might be called *estimation bias* and *application bias*. These terms are not standard in the statistical literature, but are used here to provide a sense for the different impacts that

nonresponses may have. What is called here estimation bias results from improper handling of what most statisticians call *missing completely at random* or the slightly weaker *ignorable nonresponse*. In the context of estimators proposed in the previous report, estimation bias results from the use of inaccurate inclusion probabilities in formulae for estimation and inference. That is, the probability that a given unit is sampled and provides a response to be used in estimation differs from the probability that the unit is sampled, and use of the latter in estimation may lead to inaccurate results. Such estimation bias may be adjusted for in a relatively straightforward manner.

Application bias presents a much more difficult problem. Application bias occurs if sampled units that result in a nonresponse differ in a systematic manner (with regard to the response of interest) from other units in the sample. Little can be done to alleviate the problem of application bias if nothing is known about the relation between the value of responses and the probability of response or nonresponse. Information on this relation that is useful may be either *direct* or *indirect*. Direct information is sometimes obtained through a process of *double sampling* in which additional efforts are made to obtain responses from a subset of the units that resulted in nonresponse in the original sample. This option does not appear to be feasible in the current situation. Indirect information is available if a relation can be estimated between response value and auxiliary variables. For example, if cost of refrigeration could be related to age of vessel, then it might be possible to *predict* responses for sampled nonresponding units based on vessel age. This is known as *imputation* of missing responses and there are a variety of statistical methods by which such imputation may be accomplished. No information of this type is available in the current situation, for which no responses of any kind have yet been observed, yet alone relations discovered between those responses and any other

variable or variables. Thus, it is highly doubtful that formal imputation procedures hold much promise for dealing with potential application bias in the survey currently being designed. While application bias is a potentially serious problem, there is no evidence that indicates it will be present in a survey of shrimp fishermen. There is, of course, also no evidence that it will not be present. A troublesome aspect of this study is that it appears impossible to obtain direct information about possible relations (or lack thereof) between response values and probability of response. This suggests that the potential problem of application bias in survey nonresponse will be difficult to resolve based on information gathered in the present survey.

The preceding discussion implies that what is called here application bias, which results from non-random missing nonresponse, or non-ignorable nonresponse, cannot be adequately dealt with in the current survey. There appears to be no other choice than to make an assumption of missing completely at random and to take steps to adjust estimators to eliminate estimation bias. This is not terribly difficult for the estimators proposed in the previous report. Those estimators depended on the computation of inclusion probabilities for sampled units, that is, the probability that a given unit (vessel) in the population was chosen for inclusion in the sample. For example, if $\{y_i : i = 1, \dots, N\}$ are the values of a response of interest for units in a population of size N , and if $\pi_i = Pr(\text{unit } i \text{ is chosen for inclusion in the sample})$, then an estimate of the population total for the response is

$$\hat{\tau}_y = \sum_{i \in \mathcal{S}} \pi_i^{-1} y_i, \quad (7)$$

where \mathcal{S} denotes a sample of size n . Equation (7) is the basic *Horvitz-Thompson* estimator of a population total, and forms the basis for many of the derived estimators proposed in the previous report. In (7) the inverse of the *inclusion probabilities* π_i are weights for estimation of the population total. One way in which this can be understood is to consider the following. If every unit in the population were observed,

the actual population total could be computed using $\pi_i = 1$ for all $i = 1, \dots, N$. If $1/2$ of the units in the population were observed at random, then $\pi_i = 1/2$ for all i , and each unit in the sample would “represent” two units in the population. Similarly, if $1/10$ of the population were randomly sampled, each unit included in the sample would represent 10 units in the population. Now, if a given unit is included in the sample with probability $1/20$ while another unit in the sample is included with probability $1/5$, then the first represents 20 units in the population, while the second represents 5 units in the population.

Under an assumption of missing at random, estimation bias can be eliminated through an adjustment of the inclusion probabilities used in estimation. That is, the weighting scheme described above is adjusted according to the probability that a sampled unit results in a usable response. For example, if a group of population units have probability of inclusion in the sample of $1/5$, but the probability of a response from those sampled units is only $1/3$, then the probability that one of those units contributes a usable response in estimation of the population total is $1/15$. Thus, the sampled units for which responses are observed now represent 15 units in the population, rather than the original 5 units that would have resulted if all sampled units provided a response. Mathematically, this results in an adjustment of the estimator (7) to the form

$$\hat{\tau}_y = \sum_{i \in \mathcal{S}} (\pi_i p_i)^{-1} y_i, \quad (8)$$

where p_i represents the probability that a sampled unit results in a usable response, or the conditional probability of response given selection for the sample.

The difficulty with the estimator (8) is that the conditional probabilities of response given selection for the sample (i.e., the p_i) are not known, and are not produced through the sampling plan, as are the inclusion probabilities π_i . Thus,

they must be estimated from sample data, resulting in the estimator

$$\hat{\tau}_y = \sum_{i \in \mathcal{S}} (\pi_i \hat{p}_i)^{-1} y_i. \quad (9)$$

The estimated response probabilities \hat{p}_i in equation (9) may be taken as the proportion of sampled units that respond within a given subclass of the sample, often called *weighting classes*. For example, these values might be produced as the proportion of units within a sampling strata that provide usable responses. Or, they might be calculated as the proportion of sampled units within one of the strata in a post-stratification scheme that provide responses. Alternatively, they might be estimated based on a logistic regression of the probability of response against any number of potential auxiliary variables, possibly followed by grouping or “coarsening” of the results into classes of which all members receive equal weight. The most appropriate form of estimation for the (conditional) response probabilities cannot be selected prior to examination of data that result from the initial survey. Also, while the point estimators presented in the previous report are easily modified as illustrated above (i.e., use of $\pi_i \hat{p}_i$ rather than π_i alone), variance formulae are more greatly affected. This is because estimation of the p_i as \hat{p}_i introduces an additional source of variability into the estimation procedure. Attempts can be made to incorporate this additional uncertainty into estimated variances through various approximations, such as the Taylor series expansions employed in the previous report. In general, adjustments such as described above are most useful in situations for which nonresponse bias is expected to constitute a larger problem than the increase in uncertainty caused by the need to estimate response probabilities.

It is worthy of repeated emphasis that the type of *weighting adjustment* described immediately above is meant to deal with potential estimation bias under an assumption of missing at random or ignorable missingness. It is not meant to deal with application bias that results from nonresponses that differ in a systematic fashion

from responses. At the same time, it is superior to the naive approach of drawing a "larger than anticipated" sample, with subsequent analysis pretending that the realized sample size involved complete response (e.g., Little and Rubin, 2002).

References

Little, R.J.A. and Rubin, D.B. (2002), *Statistical Analysis with Missing Data* 2nd ed., New York: Wiley.

§ 600.240

knowingly and willfully fail to disclose, or to falsely disclose, any financial interest as required by this section, or to knowingly vote on a Council decision in violation of this section. In addition to the penalties applicable under § 600.735, a violation of this provision may result in removal of the affected individual from Council membership.

[63 FR 64185, Nov. 19, 1998]

§ 600.240 Security assurances.

(a) DOC/OS will issue security assurances to Council nominees and members following completion of background checks. Security assurances will be valid for 5 years from the date of issuance. A security assurance will not entitle the member to access classified data. In instances in which Council members may need to discuss, at closed meetings, materials classified for national security purposes, the agency or individual (e.g., DOS, USCG) providing such classified information will be responsible for ensuring that Council members and other attendees have the appropriate security clearances.

(b) Each nominee to a Council is required to complete a Certification of Status form ("form"). All nominees must certify, pursuant to the Foreign Agents Registration Act of 1938, whether they serve as an agent of a foreign principal. Each nominee must certify, date, sign, and return the form with his or her completed nomination kit. Nominees will not be considered for appointment to a Council if they have not filed this form. Any nominee who currently is an agent of a foreign principal will not be eligible for appointment to a Council, and therefore should not be nominated by a Governor for appointment.

§ 600.245 Council member compensation.

(a) All voting Council members whose eligibility for compensation has been established in accordance with NOAA guidelines will be paid through the cooperative agreement as a direct line item on a contractual basis without deductions being made for Social Security or Federal and state income taxes. A report of compensation will be

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furnished each year by the member's Council to the proper Regional Program Officer, as required by the Internal Revenue Service. Such compensation may be paid on a full day's basis, whether in excess of 8 hours a day or less than 8 hours a day. The time is compensable where the individual member is required to expend a significant private effort that substantially disrupts the daily routine to the extent that a work day is lost to the member. "Homework" time in preparation for formal Council meetings is not compensable.

(b) Non-government Council members receive compensation for:

(1) Days spent in actual attendance at a meeting of the Council or jointly with another Council.

(2) Travel on the day preceding or following a scheduled meeting that precluded the member from conducting his normal business on the day in question.

(3) Meetings of standing committees of the Council if approved in advance by the Chair.

(4) Individual member meeting with scientific and technical advisors, when approved in advance by the Chair and a substantial portion of any day is spent at the meeting.

(5) Conducting or attending hearings, when authorized in advance by the Chair.

(6) Other meetings involving Council business when approved in advance by the Chair.

(c) The Executive Director of each Council must submit to the appropriate Regional Office annually a report, approved by the Council Chair, of Council member compensation authorized. This report shall identify, for each member, amount paid, dates, and location and purpose of meetings attended.

[61 FR 32540, June 24, 1996, as amended at 63 FR 7075, Feb. 12, 1998; 66 FR 57888, Nov. 19, 2001]

Subpart D—National Standards

§ 600.305 General.

(a) *Purpose.* (1) This subpart establishes guidelines, based on the national standards, to assist in the development and review of FMPs, amendments, and

regulations prepared by the Councils and the Secretary.

(2) In developing FMPs, the Councils have the initial authority to ascertain factual circumstances, to establish management objectives, and to propose management measures that will achieve the objectives. The Secretary will determine whether the proposed management objectives and measures are consistent with the national standards, other provisions of the Magnuson-Stevens Act, and other applicable law. The Secretary has an obligation under section 301(b) of the Magnuson-Stevens Act to inform the Councils of the Secretary's interpretation of the national standards so that they will have an understanding of the basis on which FMPs will be reviewed.

(3) The national standards are statutory principles that must be followed in any FMP. The guidelines summarize Secretarial interpretations that have been, and will be, applied under these principles. The guidelines are intended as aids to decisionmaking; FMPs formulated according to the guidelines will have a better chance for expeditious Secretarial review, approval, and implementation. FMPs that are in substantial compliance with the guidelines, the Magnuson-Stevens Act, and other applicable law must be approved.

(b) *Fishery management objectives.* (1) Each FMP, whether prepared by a Council or by the Secretary, should identify what the FMP is designed to accomplish (i.e., the management objectives to be attained in regulating the fishery under consideration). In establishing objectives, Councils balance biological constraints with human needs, reconcile present and future costs and benefits, and integrate the diversity of public and private interests. If objectives are in conflict, priorities should be established among them.

(2) How objectives are defined is important to the management process. Objectives should address the problems of a particular fishery. The objectives should be clearly stated, practicably attainable, framed in terms of definable events and measurable benefits, and based upon a comprehensive rather than a fragmentary approach to the problems addressed. An FMP should

make a clear distinction between objectives and the management measures chosen to achieve them. The objectives of each FMP provide the context within which the Secretary will judge the consistency of an FMP's conservation and management measures with the national standards.

(c) *Word usage.* The word usage refers to all regulations in this subpart.

(1) *Must* is used, instead of "shall", to denote an obligation to act; it is used primarily when referring to requirements of the Magnuson-Stevens Act, the logical extension thereof, or of other applicable law.

(2) *Shall* is used only when quoting statutory language directly, to avoid confusion with the future tense.

(3) *Should* is used to indicate that an action or consideration is strongly recommended to fulfill the Secretary's interpretation of the Magnuson-Stevens Act, and is a factor reviewers will look for in evaluating a SOPP or FMP.

(4) *May* is used in a permissive sense.

(5) *May not* is proscriptive; it has the same force as "must not."

(6) *Will* is used descriptively, as distinguished from denoting an obligation to act or the future tense.

(7) *Could* is used when giving examples, in a hypothetical, permissive sense.

(8) *Can* is used to mean "is able to," as distinguished from "may."

(9) *Examples* are given by way of illustration and further explanation. They are not inclusive lists; they do not limit options.

(10) *Analysis*, as a paragraph heading, signals more detailed guidance as to the type of discussion and examination an FMP should contain to demonstrate compliance with the standard in question.

(11) *Council* includes the Secretary, as applicable, when preparing FMPs or amendments under section 304(c) and (g) of the Magnuson-Stevens Act.

(12) *Stock or stock complex* is used as a synonym for "fishery" in the sense of the Magnuson-Stevens Act's first definition of the term; that is, as "one or more stocks of fish that can be treated as a unit for purposes of conservation

and management and that are identified on the basis of geographic, scientific, technical, recreational, or economic characteristics,” as distinguished from the Magnuson-Stevens Act’s second definition of fishery as “any fishing for such stocks.”

[61 FR 32540, June 24, 1996, as amended at 63 FR 7075, Feb. 12, 1998; 63 FR 24229, May 1, 1998]

§ 600.310 National Standard 1—Optimum Yield.

(a) *Standard 1.* Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the OY from each fishery for the U.S. fishing industry.

(b) *General.* The determination of OY is a decisional mechanism for resolving the Magnuson-Stevens Act’s multiple purposes and policies, implementing an FMP’s objectives, and balancing the various interests that comprise the national welfare. OY is based on MSY, or on MSY as it may be reduced under paragraph (f)(3) of this section. The most important limitation on the specification of OY is that the choice of OY and the conservation and management measures proposed to achieve it must prevent overfishing.

(c) *MSY.* Each FMP should include an estimate of MSY as explained in this section.

(1) *Definitions.* (i) “MSY” is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions.

(ii) “MSY control rule” means a harvest strategy which, if implemented, would be expected to result in a long-term average catch approximating MSY.

(iii) “MSY stock size” means the long-term average size of the stock or stock complex, measured in terms of spawning biomass or other appropriate units, that would be achieved under an MSY control rule in which the fishing mortality rate is constant.

(2) *Options in specifying MSY.* (i) Because MSY is a theoretical concept, its estimation in practice is conditional on the choice of an MSY control rule. In choosing an MSY control rule, Councils should be guided by the characteristics of the fishery, the FMP’s objec-

tives, and the best scientific information available. The simplest MSY control rule is to remove a constant catch in each year that the estimated stock size exceeds an appropriate lower bound, where this catch is chosen so as to maximize the resulting long-term average yield. Other examples include the following: Remove a constant fraction of the biomass in each year, where this fraction is chosen so as to maximize the resulting long-term average yield; allow a constant level of escapement in each year, where this level is chosen so as to maximize the resulting long-term average yield; vary the fishing mortality rate as a continuous function of stock size, where the parameters of this function are constant and chosen so as to maximize the resulting long-term average yield. In any MSY control rule, a given stock size is associated with a given level of fishing mortality and a given level of potential harvest, where the long-term average of these potential harvests provides an estimate of MSY.

(ii) Any MSY values used in determining OY will necessarily be estimates, and these will typically be associated with some level of uncertainty. Such estimates must be based on the best scientific information available (see § 600.315) and must incorporate appropriate consideration of risk (see § 600.335). Beyond these requirements, however, Councils have a reasonable degree of latitude in determining which estimates to use and how these estimates are to be expressed. For example, a point estimate of MSY may be expressed by itself or together with a confidence interval around that estimate.

(iii) In the case of a mixed-stock fishery, MSY should be specified on a stock-by-stock basis. However, where MSY cannot be specified for each stock, then MSY may be specified on the basis of one or more species as an indicator for the mixed stock as a whole or for the fishery as a whole.

(iv) Because MSY is a long-term average, it need not be estimated annually, but it must be based on the best scientific information available, and should be re-estimated as required by changes in environmental or ecological

conditions or new scientific information.

(3) *Alternatives to specifying MSY.* When data are insufficient to estimate MSY directly, Councils should adopt other measures of productive capacity that can serve as reasonable proxies for MSY, to the extent possible. Examples include various reference points defined in terms of relative spawning per recruit. For instance, the fishing mortality rate that reduces the long-term average level of spawning per recruit to 30–40 percent of the long-term average that would be expected in the absence of fishing may be a reasonable proxy for the MSY fishing mortality rate. The long-term average stock size obtained by fishing year after year at this rate under average recruitment may be a reasonable proxy for the MSY stock size, and the long-term average catch so obtained may be a reasonable proxy for MSY. The natural mortality rate may also be a reasonable proxy for the MSY fishing mortality rate. If a reliable estimate of pristine stock size (i.e., the long-term average stock size that would be expected in the absence of fishing) is available, a stock size approximately 40 percent of this value may be a reasonable proxy for the MSY stock size, and the product of this stock size and the natural mortality rate may be a reasonable proxy for MSY.

(d) *Overfishing*—(1) *Definitions.* (i) “To overfish” means to fish at a rate or level that jeopardizes the capacity of a stock or stock complex to produce MSY on a continuing basis.

(ii) “Overfishing” occurs whenever a stock or stock complex is subjected to a rate or level of fishing mortality that jeopardizes the capacity of a stock or stock complex to produce MSY on a continuing basis.

(iii) In the Magnuson-Stevens Act, the term “overfished” is used in two senses: First, to describe any stock or stock complex that is subjected to a rate or level of fishing mortality meeting the criterion in paragraph (d)(1)(i) of this section, and second, to describe any stock or stock complex whose size is sufficiently small that a change in management practices is required in order to achieve an appropriate level and rate of rebuilding. To avoid confu-

sion, this section uses “overfished” in the second sense only.

(2) *Specification of status determination criteria.* Each FMP must specify, to the extent possible, objective and measurable status determination criteria for each stock or stock complex covered by that FMP and provide an analysis of how the status determination criteria were chosen and how they relate to reproductive potential. Status determination criteria must be expressed in a way that enables the Council and the Secretary to monitor the stock or stock complex and determine annually whether overfishing is occurring and whether the stock or stock complex is overfished. In all cases, status determination criteria must specify both of the following:

(i) *A maximum fishing mortality threshold or reasonable proxy thereof.* The fishing mortality threshold may be expressed either as a single number or as a function of spawning biomass or other measure of productive capacity. The fishing mortality threshold must not exceed the fishing mortality rate or level associated with the relevant MSY control rule. Exceeding the fishing mortality threshold for a period of 1 year or more constitutes overfishing.

(ii) *A minimum stock size threshold or reasonable proxy thereof.* The stock size threshold should be expressed in terms of spawning biomass or other measure of productive capacity. To the extent possible, the stock size threshold should equal whichever of the following is greater: One-half the MSY stock size, or the minimum stock size at which rebuilding to the MSY level would be expected to occur within 10 years if the stock or stock complex were exploited at the maximum fishing mortality threshold specified under paragraph (d)(2)(i) of this section. Should the actual size of the stock or stock complex in a given year fall below this threshold, the stock or stock complex is considered overfished.

(3) *Relationship of status determination criteria to other national standards*—(i) *National standard 2.* Status determination criteria must be based on the best scientific information available (see § 600.315). When data are insufficient to estimate MSY, Councils should base

status determination criteria on reasonable proxies thereof to the extent possible (also see paragraph (c)(3) of this section). In cases where scientific data are severely limited, effort should also be directed to identifying and gathering the needed data.

(ii) *National standard 3.* The requirement to manage interrelated stocks of fish as a unit or in close coordination notwithstanding (see § 600.320), status determination criteria should generally be specified in terms of the level of stock aggregation for which the best scientific information is available (also see paragraph (c)(2)(iii) of this section).

(iii) *National standard 6.* Councils must build into the status determination criteria appropriate consideration of risk, taking into account uncertainties in estimating harvest, stock conditions, life history parameters, or the effects of environmental factors (see § 600.335).

(4) *Relationship of status determination criteria to environmental change.* Some short-term environmental changes can alter the current size of a stock or stock complex without affecting the long-term productive capacity of the stock or stock complex. Other environmental changes affect both the current size of the stock or stock complex and the long-term productive capacity of the stock or stock complex.

(i) If environmental changes cause a stock or stock complex to fall below the minimum stock size threshold without affecting the long-term productive capacity of the stock or stock complex, fishing mortality must be constrained sufficiently to allow rebuilding within an acceptable time frame (also see paragraph (e)(4)(ii) of this section). Status determination criteria need not be respecified.

(ii) If environmental changes affect the long-term productive capacity of the stock or stock complex, one or more components of the status determination criteria must be respecified. Once status determination criteria have been respecified, fishing mortality may or may not have to be reduced, depending on the status of the stock or stock complex with respect to the new criteria.

(iii) If manmade environmental changes are partially responsible for a

stock or stock complex being in an overfished condition, in addition to controlling effort, Councils should recommend restoration of habitat and other ameliorative programs, to the extent possible (see also the guidelines issued pursuant to section 305(b) of the Magnuson-Stevens Act for Council actions concerning essential fish habitat).

(5) *Secretarial approval of status determination criteria.* Secretarial approval or disapproval of proposed status determination criteria will be based on consideration of whether the proposal:

- (i) Has sufficient scientific merit.
- (ii) Contains the elements described in paragraph (d)(2) of this section.
- (iii) Provides a basis for objective measurement of the status of the stock or stock complex against the criteria.
- (iv) Is operationally feasible.

(6) *Exceptions.* There are certain limited exceptions to the requirement to prevent overfishing. Harvesting one species of a mixed-stock complex at its optimum level may result in the overfishing of another stock component in the complex. A Council may decide to permit this type of overfishing only if all of the following conditions are satisfied:

(i) It is demonstrated by analysis (paragraph (f)(6) of this section) that such action will result in long-term net benefits to the Nation.

(ii) It is demonstrated by analysis that mitigating measures have been considered and that a similar level of long-term net benefits cannot be achieved by modifying fleet behavior, gear selection/configuration, or other technical characteristic in a manner such that no overfishing would occur.

(iii) The resulting rate or level of fishing mortality will not cause any species or evolutionarily significant unit thereof to require protection under the ESA.

(e) *Ending overfishing and rebuilding overfished stocks—* (1) *Definition.* A threshold, either maximum fishing mortality or minimum stock size, is being “approached” whenever it is projected that the threshold will be breached within 2 years, based on trends in fishing effort, fishery resource size, and other appropriate factors.

(2) *Notification.* The Secretary will immediately notify a Council and request that remedial action be taken whenever the Secretary determines that:

- (i) Overfishing is occurring;
- (ii) A stock or stock complex is overfished;
- (iii) The rate or level of fishing mortality for a stock or stock complex is approaching the maximum fishing mortality threshold;
- (iv) A stock or stock complex is approaching its minimum stock size threshold; or
- (v) Existing remedial action taken for the purpose of ending previously identified overfishing or rebuilding a previously identified overfished stock or stock complex has not resulted in adequate progress.

(3) *Council action.* Within 1 year of such time as the Secretary may identify that overfishing is occurring, that a stock or stock complex is overfished, or that a threshold is being approached, or such time as a Council may be notified of the same under paragraph (e)(2) of this section, the Council must take remedial action by preparing an FMP, FMP amendment, or proposed regulations. This remedial action must be designed to accomplish all of the following purposes that apply:

- (i) If overfishing is occurring, the purpose of the action is to end overfishing.
- (ii) If the stock or stock complex is overfished, the purpose of the action is to rebuild the stock or stock complex to the MSY level within an appropriate time frame.
- (iii) If the rate or level of fishing mortality is approaching the maximum fishing mortality threshold (from below), the purpose of the action is to prevent this threshold from being reached.
- (iv) If the stock or stock complex is approaching the minimum stock size threshold (from above), the purpose of the action is to prevent this threshold from being reached.

(4) *Constraints on Council action.* (i) In cases where overfishing is occurring, Council action must be sufficient to end overfishing.

(ii) In cases where a stock or stock complex is overfished, Council action must specify a time period for rebuilding the stock or stock complex that satisfies the requirements of section 304(e)(4)(A) of the Magnuson-Stevens Act.

(A) A number of factors enter into the specification of the time period for rebuilding:

- (1) The status and biology of the stock or stock complex;
- (2) Interactions between the stock or stock complex and other components of the marine ecosystem (also referred to as “other environmental conditions”);
- (3) The needs of fishing communities;
- (4) Recommendations by international organizations in which the United States participates; and
- (5) Management measures under an international agreement in which the United States participates.

(B) These factors enter into the specification of the time period for rebuilding as follows:

(1) The lower limit of the specified time period for rebuilding is determined by the status and biology of the stock or stock complex and its interactions with other components of the marine ecosystem, and is defined as the amount of time that would be required for rebuilding if fishing mortality were eliminated entirely.

(2) If the lower limit is less than 10 years, then the specified time period for rebuilding may be adjusted upward to the extent warranted by the needs of fishing communities and recommendations by international organizations in which the United States participates, except that no such upward adjustment can result in the specified time period exceeding 10 years, unless management measures under an international agreement in which the United States participates dictate otherwise.

(3) If the lower limit is 10 years or greater, then the specified time period for rebuilding may be adjusted upward to the extent warranted by the needs of fishing communities and recommendations by international organizations in which the United States participates, except that no such upward adjustment can exceed the rebuilding period calculated in the absence of fishing mortality, plus one mean generation time

or equivalent period based on the species' life-history characteristics. For example, suppose a stock could be rebuilt within 12 years in the absence of any fishing mortality, and has a mean generation time of 8 years. The rebuilding period, in this case, could be as long as 20 years.

(C) A rebuilding program undertaken after May 1, 1998 commences as soon as the first measures to rebuild the stock or stock complex are implemented.

(D) In the case of rebuilding plans that were already in place as of May 1, 1998, such rebuilding plans must be reviewed to determine whether they are in compliance with all requirements of the Magnuson-Stevens Act, as amended by the Sustainable Fisheries Act.

(iii) For fisheries managed under an international agreement, Council action must reflect traditional participation in the fishery, relative to other nations, by fishermen of the United States.

(5) *Interim measures.* The Secretary, on his/her own initiative or in response to a Council request, may implement interim measures to reduce overfishing under section 305(c) of the Magnuson-Stevens Act, until such measures can be replaced by an FMP, FMP amendment, or regulations taking remedial action.

(i) These measures may remain in effect for no more than 180 days, but may be extended for an additional 180 days if the public has had an opportunity to comment on the measures and, in the case of Council-recommended measures, the Council is actively preparing an FMP, FMP amendment, or proposed regulations to address overfishing on a permanent basis. Such measures, if otherwise in compliance with the provisions of the Magnuson-Stevens Act, may be implemented even though they are not sufficient by themselves to stop overfishing of a fishery.

(ii) If interim measures are made effective without prior notice and opportunity for comment, they should be reserved for exceptional situations, because they affect fishermen without providing the usual procedural safeguards. A Council recommendation for interim measures without notice-and-comment rulemaking will be considered favorably if the short-term bene-

fits of the measures in reducing overfishing outweigh the value of advance notice, public comment, and deliberative consideration of the impacts on participants in the fishery.

(f) *OY—(1) Definitions.* (i) The term “optimum,” with respect to the yield from a fishery, means the amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems; that is prescribed on the basis of the MSY from the fishery, as reduced by any relevant economic, social, or ecological factor; and, in the case of an overfished fishery, that provides for rebuilding to a level consistent with producing the MSY in such fishery.

(ii) In national standard 1, use of the phrase “achieving, on a continuing basis, the OY from each fishery” means producing, from each fishery, a long-term series of catches such that the average catch is equal to the average OY and such that status determination criteria are met.

(2) *Values in determination.* In determining the greatest benefit to the Nation, these values that should be weighed are food production, recreational opportunities, and protection afforded to marine ecosystems. They should receive serious attention when considering the economic, social, or ecological factors used in reducing MSY to obtain OY.

(i) The benefits of food production are derived from providing seafood to consumers, maintaining an economically viable fishery together with its attendant contributions to the national, regional, and local economies, and utilizing the capacity of the Nation's fishery resources to meet nutritional needs.

(ii) The benefits of recreational opportunities reflect the quality of both the recreational fishing experience and non-consumptive fishery uses such as ecotourism, fish watching, and recreational diving, and the contribution of recreational fishing to the national, regional, and local economies and food supplies.

(iii) The benefits of protection afforded to marine ecosystems are those

resulting from maintaining viable populations (including those of unexploited species), maintaining evolutionary and ecological processes (e.g., disturbance regimes, hydrological processes, nutrient cycles), maintaining the evolutionary potential of species and ecosystems, and accommodating human use.

(3) *Factors relevant to OY.* Because fisheries have finite capacities, any attempt to maximize the measures of benefit described in paragraph (f)(2) of this section will inevitably encounter practical constraints. One of these is MSY. Moreover, various factors can constrain the optimum level of catch to a value less than MSY. The Magnuson-Stevens Act's definition of OY identifies three categories of such factors: Social, economic, and ecological. Not every factor will be relevant in every fishery. For some fisheries, insufficient information may be available with respect to some factors to provide a basis for corresponding reductions in MSY.

(i) *Social factors.* Examples are enjoyment gained from recreational fishing, avoidance of gear conflicts and resulting disputes, preservation of a way of life for fishermen and their families, and dependence of local communities on a fishery. Other factors that may be considered include the cultural place of subsistence fishing, obligations under Indian treaties, and worldwide nutritional needs.

(ii) *Economic factors.* Examples are prudent consideration of the risk of overharvesting when a stock's size or productive capacity is uncertain, satisfaction of consumer and recreational needs, and encouragement of domestic and export markets for U.S.-harvested fish. Other factors that may be considered include the value of fisheries, the level of capitalization, the decrease in cost per unit of catch afforded by an increase in stock size, and the attendant increase in catch per unit of effort, alternate employment opportunities, and economies of coastal areas.

(iii) *Ecological factors.* Examples are stock size and age composition, the vulnerability of incidental or unregulated stocks in a mixed-stock fishery, predator-prey or competitive interactions, and dependence of marine

mammals and birds or endangered species on a stock of fish. Also important are ecological or environmental conditions that stress marine organisms, such as natural and manmade changes in wetlands or nursery grounds, and effects of pollutants on habitat and stocks.

(4) *Specification.* (i) The amount of fish that constitutes the OY should be expressed in terms of numbers or weight of fish. However, OY may be expressed as a formula that converts periodic stock assessments into target harvest levels; in terms of an annual harvest of fish or shellfish having a minimum weight, length, or other measurement; or as an amount of fish taken only in certain areas, in certain seasons, with particular gear, or by a specified amount of fishing effort.

(ii) Either a range or a single value may be specified for OY. Specification of a numerical, fixed-value OY does not preclude use of annual target harvest levels that vary with stock size. Such target harvest levels may be prescribed on the basis of an OY control rule similar to the MSY control rule described in paragraph (c)(1)(ii) of this section, but designed to achieve OY on average, rather than MSY. The annual harvest level obtained under an OY control rule must always be less than or equal to the harvest level that would be obtained under the MSY control rule.

(iii) All fishing mortality must be counted against OY, including that resulting from bycatch, scientific research, and any other fishing activities.

(iv) The OY specification should be translatable into an annual numerical estimate for the purposes of establishing any TALFF and analyzing impacts of the management regime. There should be a mechanism in the FMP for periodic reassessment of the OY specification, so that it is responsive to changing circumstances in the fishery.

(v) The determination of OY requires a specification of MSY, which may not always be possible or meaningful. However, even where sufficient scientific data as to the biological characteristics of the stock do not exist, or where

the period of exploitation or investigation has not been long enough for adequate understanding of stock dynamics, or where frequent large-scale fluctuations in stock size diminish the meaningfulness of the MSY concept, the OY must still be based on the best scientific information available. When data are insufficient to estimate MSY directly, Councils should adopt other measures of productive capacity that can serve as reasonable proxies for MSY to the extent possible (also see paragraph (c)(3) of this section).

(vi) In a mixed-stock fishery, specification of a fishery-wide OY may be accompanied by management measures establishing separate annual target harvest levels for the individual stocks. In such cases, the sum of the individual target levels should not exceed OY.

(5) *OY and the precautionary approach.* In general, Councils should adopt a precautionary approach to specification of OY. A precautionary approach is characterized by three features:

(i) Target reference points, such as OY, should be set safely below limit reference points, such as the catch level associated with the fishing mortality rate or level defined by the status determination criteria. Because it is a target reference point, OY does not constitute an absolute ceiling, but rather a desired result. An FMP must contain conservation and management measures to achieve OY, and provisions for information collection that are designed to determine the degree to which OY is achieved on a continuing basis—that is, to result in a long-term average catch equal to the long-term average OY, while meeting the status determination criteria. These measures should allow for practical and effective implementation and enforcement of the management regime, so that the harvest is allowed to reach OY, but not to exceed OY by a substantial amount. The Secretary has an obligation to implement and enforce the FMP so that OY is achieved. If management measures prove unenforceable—or too restrictive, or not rigorous enough to realize OY—they should be modified; an alternative is to reexamine the adequacy of the OY specification. Exceeding OY does not necessarily constitute overfishing. However, even if no over-

fishing resulted from exceeding OY, continual harvest at a level above OY would violate national standard 1, because OY was not achieved on a continuing basis.

(ii) A stock or stock complex that is below the size that would produce MSY should be harvested at a lower rate or level of fishing mortality than if the stock or stock complex were above the size that would produce MSY.

(iii) Criteria used to set target catch levels should be explicitly risk averse, so that greater uncertainty regarding the status or productive capacity of a stock or stock complex corresponds to greater caution in setting target catch levels. Part of the OY may be held as a reserve to allow for factors such as uncertainties in estimates of stock size and DAH. If an OY reserve is established, an adequate mechanism should be included in the FMP to permit timely release of the reserve to domestic or foreign fishermen, if necessary.

(6) *Analysis.* An FMP must contain an assessment of how its OY specification was determined (section 303(a)(3) of the Magnuson-Stevens Act). It should relate the explanation of overfishing in paragraph (d) of this section to conditions in the particular fishery and explain how its choice of OY and conservation and management measures will prevent overfishing in that fishery. A Council must identify those economic, social, and ecological factors relevant to management of a particular fishery, then evaluate them to determine the amount, if any, by which MSY exceeds OY. The choice of a particular OY must be carefully defined and documented to show that the OY selected will produce the greatest benefit to the Nation. If overfishing is permitted under paragraph (d)(6) of this section, the assessment must contain a justification in terms of overall benefits, including a comparison of benefits under alternative management measures, and an analysis of the risk of any species or ecologically significant unit thereof reaching a threatened or endangered status, as well as the risk of any stock or stock complex falling below its minimum stock size threshold.

(7) *OY and foreign fishing.* Section 201(d) of the Magnuson-Stevens Act

provides that fishing by foreign nations is limited to that portion of the OY that will not be harvested by vessels of the United States.

(i) *DAH*. Councils must consider the capacity of, and the extent to which, U.S. vessels will harvest the OY on an annual basis. Estimating the amount that U.S. fishing vessels will actually harvest is required to determine the surplus.

(ii) *DAP*. Each FMP must assess the capacity of U.S. processors. It must also assess the amount of DAP, which is the sum of two estimates: The estimated amount of U.S. harvest that domestic processors will process, which may be based on historical performance or on surveys of the expressed intention of manufacturers to process, supported by evidence of contracts, plant expansion, or other relevant information; and the estimated amount of fish that will be harvested by domestic vessels, but not processed (e.g., marketed as fresh whole fish, used for private consumption, or used for bait).

(iii) *JVP*. When DAH exceeds DAP, the surplus is available for JVP. JVP is derived from DAH.

[63 FR 24229, May 1, 1998]

§ 600.315 National Standard 2—Scientific Information.

(a) *Standard 2*. Conservation and management measures shall be based upon the best scientific information available.

(b) *FMP development*. The fact that scientific information concerning a fishery is incomplete does not prevent the preparation and implementation of an FMP (see related §§ 600.320(d)(2) and 600.340(b)).

(1) Scientific information includes, but is not limited to, information of a biological, ecological, economic, or social nature. Successful fishery management depends, in part, on the timely availability, quality, and quantity of scientific information, as well as on the thorough analysis of this information, and the extent to which the information is applied. If there are conflicting facts or opinions relevant to a particular point, a Council may choose among them, but should justify the choice.

(2) FMPs must take into account the best scientific information available at the time of preparation. Between the initial drafting of an FMP and its submission for final review, new information often becomes available. This new information should be incorporated into the final FMP where practicable; but it is unnecessary to start the FMP process over again, unless the information indicates that drastic changes have occurred in the fishery that might require revision of the management objectives or measures.

(c) *FMP implementation*. (1) An FMP must specify whatever information fishermen and processors will be required or requested to submit to the Secretary. Information about harvest within state boundaries, as well as in the EEZ, may be collected if it is needed for proper implementation of the FMP and cannot be obtained otherwise. The FMP should explain the practical utility of the information specified in monitoring the fishery, in facilitating inseason management decisions, and in judging the performance of the management regime; it should also consider the effort, cost, or social impact of obtaining it.

(2) An FMP should identify scientific information needed from other sources to improve understanding and management of the resource, marine ecosystem, and the fishery (including fishing communities).

(3) The information submitted by various data suppliers should be comparable and compatible, to the maximum extent possible.

(d) *FMP amendment*. FMPs should be amended on a timely basis, as new information indicates the necessity for change in objectives or management measures.

(e) *SAFE Report*. (1) The SAFE report is a document or set of documents that provides Councils with a summary of information concerning the most recent biological condition of stocks and the marine ecosystems in the FMP and the social and economic condition of the recreational and commercial fishing interests, fishing communities, and the fish processing industries. It summarizes, on a periodic basis, the best available scientific information concerning the past, present, and possible

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future condition of the stocks, marine ecosystems, and fisheries being managed under Federal regulation.

(i) The Secretary has the responsibility to assure that a SAFE report or similar document is prepared, reviewed annually, and changed as necessary for each FMP. The Secretary or Councils may utilize any combination of talent from Council, state, Federal, university, or other sources to acquire and analyze data and produce the SAFE report.

(ii) The SAFE report provides information to the Councils for determining annual harvest levels from each stock, documenting significant trends or changes in the resource, marine ecosystems, and fishery over time, and assessing the relative success of existing state and Federal fishery management programs. Information on bycatch and safety for each fishery should also be summarized. In addition, the SAFE report may be used to update or expand previous environmental and regulatory impact documents, and ecosystem and habitat descriptions.

(iii) Each SAFE report must be scientifically based, and cite data sources and interpretations.

(2) Each SAFE report should contain information on which to base harvest specifications.

(3) Each SAFE report should contain a description of the maximum fishing mortality threshold and the minimum stock size threshold for each stock or stock complex, along with information by which the Council may determine:

(i) Whether overfishing is occurring with respect to any stock or stock complex, whether any stock or stock complex is overfished, whether the rate or level of fishing mortality applied to any stock or stock complex is approaching the maximum fishing mortality threshold, and whether the size of any stock or stock complex is approaching the minimum stock size threshold.

(ii) Any management measures necessary to provide for rebuilding an overfished stock or stock complex (if any) to a level consistent with producing the MSY in such fishery.

(4) Each SAFE report may contain additional economic, social, community, essential fish habitat, and eco-

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logical information pertinent to the success of management or the achievement of objectives of each FMP.

(5) Each SAFE report may contain additional economic, social, and ecological information pertinent to the success of management or the achievement of objectives of each FMP.

[61 FR 32540, June 24, 1996, as amended at 63 FR 24233, May 1, 1998]

§ 600.320 National Standard 3—Management Units.

(a) *Standard 3.* To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

(b) *General.* The purpose of this standard is to induce a comprehensive approach to fishery management. The geographic scope of the fishery, for planning purposes, should cover the entire range of the stock(s) of fish, and not be overly constrained by political boundaries. Wherever practicable, an FMP should seek to manage interrelated stocks of fish.

(c) *Unity of management.* Cooperation and understanding among entities concerned with the fishery (e.g., Councils, states, Federal Government, international commissions, foreign nations) are vital to effective management. Where management of a fishery involves multiple jurisdictions, coordination among the several entities should be sought in the development of an FMP. Where a range overlaps Council areas, one FMP to cover the entire range is preferred. The Secretary designates which Council(s) will prepare the FMP, under section 304(f) of the Magnuson-Stevens Act.

(d) *Management unit.* The term “management unit” means a fishery or that portion of a fishery identified in an FMP as relevant to the FMP’s management objectives.

(1) *Basis.* The choice of a management unit depends on the focus of the FMP’s objectives, and may be organized around biological, geographic, economic, technical, social, or ecological perspectives. For example:

(i) *Biological*—could be based on a stock(s) throughout its range.

(ii) *Geographic*—could be an area.

(iii) *Economic*—could be based on a fishery supplying specific product forms.

(iv) *Technical*—could be based on a fishery utilizing a specific gear type or similar fishing practices.

(v) *Social*—could be based on fishermen as the unifying element, such as when the fishermen pursue different species in a regular pattern throughout the year.

(vi) *Ecological*—could be based on species that are associated in the ecosystem or are dependent on a particular habitat.

(2) *Conservation and management measures.* FMPs should include conservation and management measures for that part of the management unit within U.S. waters, although the Secretary can ordinarily implement them only within the EEZ. The measures need not be identical for each geographic area within the management unit, if the FMP justifies the differences. A management unit may contain, in addition to regulated species, stocks of fish for which there is not enough information available to specify MSY and OY or to establish management measures, so that data on these species may be collected under the FMP.

(e) *Analysis.* To document that an FMP is as comprehensive as practicable, it should include discussions of the following:

(1) The range and distribution of the stocks, as well as the patterns of fishing effort and harvest.

(2) Alternative management units and reasons for selecting a particular one. A less-than-comprehensive management unit may be justified if, for example, complementary management exists or is planned for a separate geographic area or for a distinct use of the stocks, or if the unmanaged portion of the resource is immaterial to proper management.

(3) Management activities and habitat programs of adjacent states and their effects on the FMP's objectives and management measures. Where state action is necessary to implement measures within state waters to achieve FMP objectives, the FMP should identify what state action is necessary, discuss the consequences of state inaction or contrary action, and

make appropriate recommendations. The FMP should also discuss the impact that Federal regulations will have on state management activities.

(4) Management activities of other countries having an impact on the fishery, and how the FMP's management measures are designed to take into account these impacts. International boundaries may be dealt with in several ways. For example:

(i) By limiting the management unit's scope to that portion of the stock found in U.S. waters;

(ii) By estimating MSY for the entire stock and then basing the determination of OY for the U.S. fishery on the portion of the stock within U.S. waters; or

(iii) By referring to treaties or cooperative agreements.

[61 FR 32540, June 24, 1996, as amended at 63 FR 24234, May 1, 1998]

§ 600.325 National Standard 4—Allocations.

(a) *Standard 4.* Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various U.S. fishermen, such allocation shall be:

(1) Fair and equitable to all such fishermen.

(2) Reasonably calculated to promote conservation.

(3) Carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

(b) *Discrimination among residents of different states.* An FMP may not differentiate among U.S. citizens, nationals, resident aliens, or corporations on the basis of their state of residence. An FMP may not incorporate or rely on a state statute or regulation that discriminates against residents of another state. Conservation and management measures that have different effects on persons in various geographic locations are permissible if they satisfy the other guidelines under Standard 4. Examples of these precepts are:

(1) An FMP that restricted fishing in the EEZ to those holding a permit from state X would violate Standard 4 if

state X issued permits only to its own citizens.

(2) An FMP that closed a spawning ground might disadvantage fishermen living in the state closest to it, because they would have to travel farther to an open area, but the closure could be justified under Standard 4 as a conservation measure with no discriminatory intent.

(c) *Allocation of fishing privileges.* An FMP may contain management measures that allocate fishing privileges if such measures are necessary or helpful in furthering legitimate objectives or in achieving the OY, and if the measures conform with paragraphs (c)(3)(i) through (c)(3)(iii) of this section.

(1) *Definition.* An “allocation” or “assignment” of fishing privileges is a direct and deliberate distribution of the opportunity to participate in a fishery among identifiable, discrete user groups or individuals. Any management measure (or lack of management) has incidental allocative effects, but only those measures that result in direct distributions of fishing privileges will be judged against the allocation requirements of Standard 4. Adoption of an FMP that merely perpetuates existing fishing practices may result in an allocation, if those practices directly distribute the opportunity to participate in the fishery. Allocations of fishing privileges include, for example, per-vessel catch limits, quotas by vessel class and gear type, different quotas or fishing seasons for recreational and commercial fishermen, assignment of ocean areas to different gear users, and limitation of permits to a certain number of vessels or fishermen.

(2) *Analysis of allocations.* Each FMP should contain a description and analysis of the allocations existing in the fishery and of those made in the FMP. The effects of eliminating an existing allocation system should be examined. Allocation schemes considered, but rejected by the Council, should be included in the discussion. The analysis should relate the recommended allocations to the FMP’s objectives and OY specification, and discuss the factors listed in paragraph (c)(3) of this section.

(3) *Factors in making allocations.* An allocation of fishing privileges must be fair and equitable, must be reasonably calculated to promote conservation, and must avoid excessive shares. These tests are explained in paragraphs (c)(3)(i) through (c)(3)(iii) of this section:

(i) *Fairness and equity.* (A) An allocation of fishing privileges should be rationally connected to the achievement of OY or with the furtherance of a legitimate FMP objective. Inherent in an allocation is the advantaging of one group to the detriment of another. The motive for making a particular allocation should be justified in terms of the objectives of the FMP; otherwise, the disadvantaged user groups or individuals would suffer without cause. For instance, an FMP objective to preserve the economic status quo cannot be achieved by excluding a group of long-time participants in the fishery. On the other hand, there is a rational connection between an objective of harvesting shrimp at their maximum size and closing a nursery area to trawling.

(B) An allocation of fishing privileges may impose a hardship on one group if it is outweighed by the total benefits received by another group or groups. An allocation need not preserve the status quo in the fishery to qualify as “fair and equitable,” if a restructuring of fishing privileges would maximize overall benefits. The Council should make an initial estimate of the relative benefits and hardships imposed by the allocation, and compare its consequences with those of alternative allocation schemes, including the status quo. Where relevant, judicial guidance and government policy concerning the rights of treaty Indians and aboriginal Americans must be considered in determining whether an allocation is fair and equitable.

(ii) *Promotion of conservation.* Numerous methods of allocating fishing privileges are considered “conservation and management” measures under section 303 of the Magnuson-Stevens Act. An allocation scheme may promote conservation by encouraging a rational, more easily managed use of the resource. Or, it may promote conservation (in the sense of wise use) by optimizing the yield in terms of size, value,

market mix, price, or economic or social benefit of the product. To the extent that rebuilding plans or other conservation and management measures that reduce the overall harvest in a fishery are necessary, any harvest restrictions or recovery benefits must be allocated fairly and equitably among the commercial, recreational, and charter fishing sectors of the fishery.

(iii) *Avoidance of excessive shares.* An allocation scheme must be designed to deter any person or other entity from acquiring an excessive share of fishing privileges, and to avoid creating conditions fostering inordinate control, by buyers or sellers, that would not otherwise exist.

(iv) *Other factors.* In designing an allocation scheme, a Council should consider other factors relevant to the FMP's objectives. Examples are economic and social consequences of the scheme, food production, consumer interest, dependence on the fishery by present participants and coastal communities, efficiency of various types of gear used in the fishery, transferability of effort to and impact on other fisheries, opportunity for new participants to enter the fishery, and enhancement of opportunities for recreational fishing.

[61 FR 32540, June 24, 1996, as amended at 63 FR 24234, May 1, 1998]

§ 600.330 National Standard 5—Efficiency.

(a) *Standard 5.* Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

(b) *Efficiency in the utilization of resources—(1) General.* The term “utilization” encompasses harvesting, processing, marketing, and non-consumptive uses of the resource, since management decisions affect all sectors of the industry. In considering efficient utilization of fishery resources, this standard highlights one way that a fishery can contribute to the Nation's benefit with the least cost to society: Given a set of objectives for the fishery, an FMP should contain management measures that result in as efficient a fishery as is practicable or desirable.

(2) *Efficiency.* In theory, an efficient fishery would harvest the OY with the minimum use of economic inputs such as labor, capital, interest, and fuel. Efficiency in terms of aggregate costs then becomes a conservation objective, where “conservation” constitutes wise use of all resources involved in the fishery, not just fish stocks.

(i) In an FMP, management measures may be proposed that allocate fish among different groups of individuals or establish a system of property rights. Alternative measures examined in searching for an efficient outcome will result in different distributions of gains and burdens among identifiable user groups. An FMP should demonstrate that management measures aimed at efficiency do not simply redistribute gains and burdens without an increase in efficiency.

(ii) Management regimes that allow a fishery to operate at the lowest possible cost (e.g., fishing effort, administration, and enforcement) for a particular level of catch and initial stock size are considered efficient. Restrictive measures that unnecessarily raise any of those costs move the regime toward inefficiency. Unless the use of inefficient techniques or the creation of redundant fishing capacity contributes to the attainment of other social or biological objectives, an FMP may not contain management measures that impede the use of cost-effective techniques of harvesting, processing, or marketing, and should avoid creating strong incentives for excessive investment in private sector fishing capital and labor.

(c) *Limited access.* A “system for limiting access,” which is an optional measure under section 303(b) of the Magnuson-Stevens Act, is a type of allocation of fishing privileges that may be considered to contribute to economic efficiency or conservation. For example, limited access may be used to combat overfishing, overcrowding, or overcapitalization in a fishery to achieve OY. In an unutilized or underutilized fishery, it may be used to reduce the chance that these conditions will adversely affect the fishery in the future, or to provide adequate economic return to pioneers in a new fishery. In some cases, limited entry is a

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useful ingredient of a conservation scheme, because it facilitates application and enforcement of other management measures.

(1) *Definition.* Limited access (or limited entry) is a management technique that attempts to limit units of effort in a fishery, usually for the purpose of reducing economic waste, improving net economic return to the fishermen, or capturing economic rent for the benefit of the taxpayer or the consumer. Common forms of limited access are licensing of vessels, gear, or fishermen to reduce the number of units of effort, and dividing the total allowable catch into fishermen's quotas (a stock-certificate system). Two forms (i.e., Federal fees for licenses or permits in excess of administrative costs, and taxation) are not permitted under the Magnuson-Stevens Act, except for fees allowed under section 304(d)(2).

(2) *Factors to consider.* The Magnuson-Stevens Act ties the use of limited access to the achievement of OY. An FMP that proposes a limited access system must consider the factors listed in section 303(b)(6) of the Magnuson-Stevens Act and in § 600.325(c)(3). In addition, it should consider the criteria for qualifying for a permit, the nature of the interest created, whether to make the permit transferable, and the Magnuson-Stevens Act's limitations on returning economic rent to the public under section 304(d). The FMP should also discuss the costs of achieving an appropriate distribution of fishing privileges.

(d) *Analysis.* An FMP should discuss the extent to which overcapitalization, congestion, economic waste, and inefficient techniques in the fishery reduce the net benefits derived from the management unit and prevent the attainment and appropriate allocation of OY. It should also explain, in terms of the FMP's objectives, any restriction placed on the use of efficient techniques of harvesting, processing, or marketing. If, during FMP development, the Council considered imposing a limited-entry system, the FMP should analyze the Council's decision to recommend or reject limited access as a technique to achieve efficient utilization of the resources of the fishing industry.

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(e) *Economic allocation.* This standard prohibits only those measures that distribute fishery resources among fishermen on the basis of economic factors alone, and that have economic allocation as their only purpose. Where conservation and management measures are recommended that would change the economic structure of the industry or the economic conditions under which the industry operates, the need for such measures must be justified in light of the biological, ecological, and social objectives of the FMP, as well as the economic objectives.

[61 FR 32540, June 24, 1996, as amended at 63 FR 7075, Feb. 12, 1998; 63 FR 24234, May 1, 1998]

§ 600.335 National Standard 6—Variations and Contingencies.

(a) *Standard 6.* Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

(b) *Conservation and management.* Each fishery exhibits unique uncertainties. The phrase "conservation and management" implies the wise use of fishery resources through a management regime that includes some protection against these uncertainties. The particular regime chosen must be flexible enough to allow timely response to resource, industry, and other national and regional needs. Continual data acquisition and analysis will help the development of management measures to compensate for variations and to reduce the need for substantial buffers. Flexibility in the management regime and the regulatory process will aid in responding to contingencies.

(c) *Variations.* (1) In fishery management terms, variations arise from biological, social, and economic occurrences, as well as from fishing practices. Biological uncertainties and lack of knowledge can hamper attempts to estimate stock size and strength, stock location in time and space, environmental/habitat changes, and ecological interactions. Economic uncertainty may involve changes in foreign or domestic market conditions, changes in operating costs, drifts toward overcapitalization, and economic perturbations caused by changed fishing patterns.

Changes in fishing practices, such as the introduction of new gear, rapid increases or decreases in harvest effort, new fishing strategies, and the effects of new management techniques, may also create uncertainties. Social changes could involve increases or decreases in recreational fishing, or the movement of people into or out of fishing activities due to such factors as age or educational opportunities.

(2) Every effort should be made to develop FMPs that discuss and take into account these vicissitudes. To the extent practicable, FMPs should provide a suitable buffer in favor of conservation. Allowances for uncertainties should be factored into the various elements of an FMP. Examples are:

(i) *Reduce OY.* Lack of scientific knowledge about the condition of a stock(s) could be reason to reduce OY.

(ii) *Establish a reserve.* Creation of a reserve may compensate for uncertainties in estimating domestic harvest, stock conditions, or environmental factors.

(iii) *Adjust management techniques.* In the absence of adequate data to predict the effect of a new regime, and to avoid creating unwanted variations, a Council could guard against producing drastic changes in fishing patterns, allocations, or practices.

(iv) *Highlight habitat conditions.* FMPs may address the impact of pollution and the effects of wetland and estuarine degradation on the stocks of fish; identify causes of pollution and habitat degradation and the authorities having jurisdiction to regulate or influence such activities; propose recommendations that the Secretary will convey to those authorities to alleviate such problems; and state the views of the Council on unresolved or anticipated issues.

(d) *Contingencies.* Unpredictable events—such as unexpected resource surges or failures, fishing effort greater than anticipated, disruptive gear conflicts, climatic conditions, or environmental catastrophes—are best handled by establishing a flexible management regime that contains a range of management options through which it is possible to act quickly without amending the FMP or even its regulations.

(1) The FMP should describe the management options and their consequences in the necessary detail to guide the Secretary in responding to changed circumstances, so that the Council preserves its role as policy-setter for the fishery. The description should enable the public to understand what may happen under the flexible regime, and to comment on the options.

(2) FMPs should include criteria for the selection of management measures, directions for their application, and mechanisms for timely adjustment of management measures comprising the regime. For example, an FMP could include criteria that allow the Secretary to open and close seasons, close fishing grounds, or make other adjustments in management measures.

(3) Amendment of a flexible FMP would be necessary when circumstances in the fishery change substantially, or when a Council adopts a different management philosophy and objectives.

§ 600.340 National Standard 7—Costs and Benefits.

(a) *Standard 7.* Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

(b) *Necessity of Federal management—*

(1) *General.* The principle that not every fishery needs regulation is implicit in this standard. The Magnuson-Stevens Act requires Councils to prepare FMPs only for overfished fisheries and for other fisheries where regulation would serve some useful purpose and where the present or future benefits of regulation would justify the costs. For example, the need to collect data about a fishery is not, by itself, adequate justification for preparation of an FMP, since there are less costly ways to gather the data (see § 600.320(d)(2)). In some cases, the FMP preparation process itself, even if it does not culminate in a document approved by the Secretary, can be useful in supplying a basis for management by one or more coastal states.

(2) *Criteria.* In deciding whether a fishery needs management through regulations implementing an FMP, the following general factors should be considered, among others:

(i) The importance of the fishery to the Nation and to the regional economy.

(ii) The condition of the stock or stocks of fish and whether an FMP can improve or maintain that condition.

(iii) The extent to which the fishery could be or is already adequately managed by states, by state/Federal programs, by Federal regulations pursuant to FMPs or international commissions, or by industry self-regulation, consistent with the policies and standards of the Magnuson-Stevens Act.

(iv) The need to resolve competing interests and conflicts among user groups and whether an FMP can further that resolution.

(v) The economic condition of a fishery and whether an FMP can produce more efficient utilization.

(vi) The needs of a developing fishery, and whether an FMP can foster orderly growth.

(vii) The costs associated with an FMP, balanced against the benefits (see paragraph (d) of this section as a guide).

(c) *Alternative management measures.* Management measures should not impose unnecessary burdens on the economy, on individuals, on private or public organizations, or on Federal, state, or local governments. Factors such as fuel costs, enforcement costs, or the burdens of collecting data may well suggest a preferred alternative.

(d) *Analysis.* The supporting analyses for FMPs should demonstrate that the benefits of fishery regulation are real and substantial relative to the added research, administrative, and enforcement costs, as well as costs to the industry of compliance. In determining the benefits and costs of management measures, each management strategy considered and its impacts on different user groups in the fishery should be evaluated. This requirement need not produce an elaborate, formalistic cost/benefit analysis. Rather, an evaluation of effects and costs, especially of differences among workable alternatives, including the status quo, is adequate. If quantitative estimates are not possible, qualitative estimates will suffice.

(1) *Burdens.* Management measures should be designed to give fishermen the greatest possible freedom of action

in conducting business and pursuing recreational opportunities that are consistent with ensuring wise use of the resources and reducing conflict in the fishery. The type and level of burden placed on user groups by the regulations need to be identified. Such an examination should include, for example: Capital outlays; operating and maintenance costs; reporting costs; administrative, enforcement, and information costs; and prices to consumers. Management measures may shift costs from one level of government to another, from one part of the private sector to another, or from the government to the private sector. Redistribution of costs through regulations is likely to generate controversy. A discussion of these and any other burdens placed on the public through FMP regulations should be a part of the FMP's supporting analyses.

(2) *Gains.* The relative distribution of gains may change as a result of instituting different sets of alternatives, as may the specific type of gain. The analysis of benefits should focus on the specific gains produced by each alternative set of management measures, including the status quo. The benefits to society that result from the alternative management measures should be identified, and the level of gain assessed.

[61 FR 32540, June 24, 1996, as amended at 63 FR 7075, Feb. 12, 1998; 63 FR 24234, May 1, 1998]

§ 600.345 National Standard 8—Communities.

(a) *Standard 8.* Conservation and management measures shall, consistent with the conservation requirements of the Magnuson-Stevens Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to:

(1) Provide for the sustained participation of such communities; and

(2) To the extent practicable, minimize adverse economic impacts on such communities.

(b) *General.* (1) This standard requires that an FMP take into account the importance of fishery resources to fishing

communities. This consideration, however, is within the context of the conservation requirements of the Magnuson-Stevens Act. Deliberations regarding the importance of fishery resources to affected fishing communities, therefore, must not compromise the achievement of conservation requirements and goals of the FMP. Where the preferred alternative negatively affects the sustained participation of fishing communities, the FMP should discuss the rationale for selecting this alternative over another with a lesser impact on fishing communities. All other things being equal, where two alternatives achieve similar conservation goals, the alternative that provides the greater potential for sustained participation of such communities and minimizes the adverse economic impacts on such communities would be the preferred alternative.

(2) This standard does not constitute a basis for allocating resources to a specific fishing community nor for providing preferential treatment based on residence in a fishing community.

(3) The term “fishing community” means a community that is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew, and fish processors that are based in such communities. A fishing community is a social or economic group whose members reside in a specific location and share a common dependency on commercial, recreational, or subsistence fishing or on directly related fisheries-dependent services and industries (for example, boatyards, ice suppliers, tackle shops).

(4) The term “sustained participation” means continued access to the fishery within the constraints of the condition of the resource.

(c) *Analysis.* (1) FMPs must examine the social and economic importance of fisheries to communities potentially affected by management measures. For example, severe reductions of harvests for conservation purposes may decrease employment opportunities for fishermen and processing plant workers, thereby adversely affecting their families and communities. Similarly, a

management measure that results in the allocation of fishery resources among competing sectors of a fishery may benefit some communities at the expense of others.

(2) An appropriate vehicle for the analyses under this standard is the fishery impact statement required by section 303(a)(9) of the Magnuson-Stevens Act. Qualitative and quantitative data may be used, including information provided by fishermen, dealers, processors, and fisheries organizations and associations. In cases where data are severely limited, effort should be directed to identifying and gathering needed data.

(3) To address the sustained participation of fishing communities that will be affected by management measures, the analysis should first identify affected fishing communities and then assess their differing levels of dependence on and engagement in the fishery being regulated. The analysis should also specify how that assessment was made. The best available data on the history, extent, and type of participation of these fishing communities in the fishery should be incorporated into the social and economic information presented in the FMP. The analysis does not have to contain an exhaustive listing of all communities that might fit the definition; a judgment can be made as to which are primarily affected. The analysis should discuss each alternative’s likely effect on the sustained participation of these fishing communities in the fishery.

(4) The analysis should assess the likely positive and negative social and economic impacts of the alternative management measures, over both the short and the long term, on fishing communities. Any particular management measure may economically benefit some communities while adversely affecting others. Economic impacts should be considered both for individual communities and for the group of all affected communities identified in the FMP. Impacts of both consumptive and non-consumptive uses of fishery resources should be considered.

(5) A discussion of social and economic impacts should identify those

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alternatives that would minimize adverse impacts on these fishing communities within the constraints of conservation and management goals of the FMP, other national standards, and other applicable law.

[63 FR 24234, May 1, 1998]

§ 600.350 National Standard 9—Bycatch.

(a) *Standard 9.* Conservation and management measures shall, to the extent practicable:

(1) Minimize bycatch; and

(2) To the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

(b) *General.* This national standard requires Councils to consider the bycatch effects of existing and planned conservation and management measures. Bycatch can, in two ways, impede efforts to protect marine ecosystems and achieve sustainable fisheries and the full benefits they can provide to the Nation. First, bycatch can increase substantially the uncertainty concerning total fishing-related mortality, which makes it more difficult to assess the status of stocks, to set the appropriate OY and define overfishing levels, and to ensure that OYs are attained and overfishing levels are not exceeded. Second, bycatch may also preclude other more productive uses of fishery resources.

(c) *Definition—Bycatch.* The term “bycatch” means fish that are harvested in a fishery, but that are not sold or kept for personal use. Bycatch includes the discard of whole fish at sea or elsewhere, including economic discards and regulatory discards, and fishing mortality due to an encounter with fishing gear that does not result in capture of fish (i.e., unobserved fishing mortality). Bycatch does not include any fish that legally are retained in a fishery and kept for personal, tribal, or cultural use, or that enter commerce through sale, barter, or trade. Bycatch does not include fish released alive under a recreational catch-and-release fishery management program. A catch-and-release fishery management program is one in which the retention of a particular species is prohibited. In such a program, those fish released alive would not be considered

bycatch. Bycatch also does not include Atlantic highly migratory species harvested in a commercial fishery that are not regulatory discards and that are tagged and released alive under a scientific tag-and-release program established by the Secretary.

(d) *Minimizing bycatch and bycatch mortality.* The priority under this standard is first to avoid catching bycatch species where practicable. Fish that are bycatch and cannot be avoided must, to the extent practicable, be returned to the sea alive. Any proposed conservation and management measure that does not give priority to avoiding the capture of bycatch species must be supported by appropriate analyses. In their evaluation, the Councils must consider the net benefits to the Nation, which include, but are not limited to: Negative impacts on affected stocks; incomes accruing to participants in directed fisheries in both the short and long term; incomes accruing to participants in fisheries that target the bycatch species; environmental consequences; non-market values of bycatch species, which include non-consumptive uses of bycatch species and existence values, as well as recreational values; and impacts on other marine organisms. To evaluate conservation and management measures relative to this and other national standards, as well as to evaluate total fishing mortality, Councils must—

(1) *Promote development of a database on bycatch and bycatch mortality in the fishery to the extent practicable.* A review and, where necessary, improvement of data collection methods, data sources, and applications of data must be initiated for each fishery to determine the amount, type, disposition, and other characteristics of bycatch and bycatch mortality in each fishery for purposes of this standard and of section 303(a)(11) and (12) of the Magnuson-Stevens Act. Bycatch should be categorized to focus on management responses necessary to minimize bycatch and bycatch mortality to the extent practicable. When appropriate, management measures, such as at-sea monitoring programs, should be developed to meet these information needs.

(2) *For each management measure, assess the effects on the amount and type of*

bycatch and bycatch mortality in the fishery. Most conservation and management measures can affect the amounts of bycatch or bycatch mortality in a fishery, as well as the extent to which further reductions in bycatch are practicable. In analyzing measures, including the status quo, Councils should assess the impacts of minimizing bycatch and bycatch mortality, as well as consistency of the selected measure with other national standards and applicable laws. The benefits of minimizing bycatch to the extent practicable should be identified and an assessment of the impact of the selected measure on bycatch and bycatch mortality provided. Due to limitations on the information available, fishery managers may not be able to generate precise estimates of bycatch and bycatch mortality or other effects for each alternative. In the absence of quantitative estimates of the impacts of each alternative, Councils may use qualitative measures. Information on the amount and type of bycatch should be summarized in the SAFE reports.

(3) *Select measures that, to the extent practicable, will minimize bycatch and bycatch mortality.* (i) A determination of whether a conservation and management measure minimizes bycatch or bycatch mortality to the extent practicable, consistent with other national standards and maximization of net benefits to the Nation, should consider the following factors:

(A) Population effects for the bycatch species.

(B) Ecological effects due to changes in the bycatch of that species (effects on other species in the ecosystem).

(C) Changes in the bycatch of other species of fish and the resulting population and ecosystem effects.

(D) Effects on marine mammals and birds.

(E) Changes in fishing, processing, disposal, and marketing costs.

(F) Changes in fishing practices and behavior of fishermen.

(G) Changes in research, administration, and enforcement costs and management effectiveness.

(H) Changes in the economic, social, or cultural value of fishing activities and nonconsumptive uses of fishery resources.

(I) Changes in the distribution of benefits and costs.

(J) Social effects.

(ii) The Councils should adhere to the precautionary approach found in the Food and Agriculture Organization of the United Nations (FAO) Code of Conduct for Responsible Fisheries (Article 6.5), which is available from the Director, Publications Division, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy, when faced with uncertainty concerning any of the factors listed in this paragraph (d)(3).

(4) *Monitor selected management measures.* Effects of implemented measures should be evaluated routinely. Monitoring systems should be established prior to fishing under the selected management measures. Where applicable, plans should be developed and coordinated with industry and other concerned organizations to identify opportunities for cooperative data collection, coordination of data management for cost efficiency, and avoidance of duplicative effort.

(e) *Other considerations.* Other applicable laws, such as the MMPA, the ESA, and the Migratory Bird Treaty Act, require that Councils consider the impact of conservation and management measures on living marine resources other than fish; i.e., marine mammals and birds.

[63 FR 24235, May 1, 1998]

§ 600.355 National Standard 10—Safety of Life at Sea.

(a) *Standard 10.* Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

(b) *General.* (1) Fishing is an inherently dangerous occupation where not all hazardous situations can be foreseen or avoided. The standard directs Councils to reduce that risk in crafting their management measures, so long as they can meet the other national standards and the legal and practical requirements of conservation and management. This standard is not meant to give preference to one method of managing a fishery over another.

(2) The qualifying phrase “to the extent practicable” recognizes that regulation necessarily puts constraints on fishing that would not otherwise exist.

These constraints may create pressures on fishermen to fish under conditions that they would otherwise avoid. This standard instructs the Councils to identify and avoid those situations, if they can do so consistent with the legal and practical requirements of conservation and management of the resource.

(3) For the purposes of this national standard, the safety of the fishing vessel and the protection from injury of persons aboard the vessel are considered the same as “safety of human life at sea. The safety of a vessel and the people aboard is ultimately the responsibility of the master of that vessel. Each master makes many decisions about vessel maintenance and loading and about the capabilities of the vessel and crew to operate safely in a variety of weather and sea conditions. This national standard does not replace the judgment or relieve the responsibility of the vessel master related to vessel safety. The Councils, the USCG, and NMFS, through the consultation process of paragraph (d) of this section, will review all FMPs, amendments, and regulations during their development to ensure they recognize any impact on the safety of human life at sea and minimize or mitigate that impact where practicable.

(c) *Safety considerations.* The following is a non-inclusive list of safety considerations that should be considered in evaluating management measures under national standard 10.

(1) *Operating environment.* Where and when a fishing vessel operates is partly a function of the general climate and weather patterns of an area. Typically, larger vessels can fish farther offshore and in more adverse weather conditions than smaller vessels. An FMP should try to avoid creating situations that result in vessels going out farther, fishing longer, or fishing in weather worse than they generally would have in the absence of management measures. Where these conditions are unavoidable, management measures should mitigate these effects, consistent with the overall management goals of the fishery.

(2) *Gear and vessel loading requirements.* A fishing vessel operates in a very dynamic environment that can be

an extremely dangerous place to work. Moving heavy gear in a seaway creates a dangerous situation on a vessel. Carrying extra gear can also significantly reduce the stability of a fishing vessel, making it prone to capsizing. An FMP should consider the safety and stability of fishing vessels when requiring specific gear or requiring the removal of gear from the water. Management measures should reflect a sensitivity to these issues and provide methods of mitigation of these situations wherever possible.

(3) *Limited season and area fisheries.* Fisheries where time constraints for harvesting are a significant factor and with no flexibility for weather, often called “derby” fisheries, can create serious safety problems. To participate fully in such a fishery, fishermen may fish in bad weather and overload their vessel with catch and/or gear. Where these conditions exist, FMPs should attempt to mitigate these effects and avoid them in new management regimes, as discussed in paragraph (e) of this section.

(d) *Consultation.* During preparation of any FMP, FMP amendment, or regulation that might affect safety of human life at sea, the Council should consult with the USCG and the fishing industry as to the nature and extent of any adverse impacts. This consultation may be done through a Council advisory panel, committee, or other review of the FMP, FMP amendment, or regulations. Mitigation, to the extent practicable, and other safety considerations identified in paragraph (c) of this section should be included in the FMP.

(e) *Mitigation measures.* There are many ways in which an FMP may avoid or provide alternative measures to reduce potential impacts on safety of human life at sea. The following is a list of some factors that could be considered when management measures are developed:

(1) Setting seasons to avoid hazardous weather.

(2) Providing for seasonal or trip flexibility to account for bad weather (weather days).

(3) Allowing for pre- and post-season “soak time” to deploy and pick up fixed gear, so as to avoid overloading vessels with fixed gear.

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(4) Tailoring gear requirements to provide for smaller or lighter gear for smaller vessels.

(5) Avoiding management measures that require hazardous at-sea inspections or enforcement if other comparable enforcement could be accomplished as effectively.

(6) Limiting the number of participants in the fishery.

(7) Spreading effort over time and area to avoid potential gear and/or vessel conflicts.

(8) Implementing management measures that reduce the race for fish and the resulting incentives for fishermen to take additional risks with respect to vessel safety.

[63 FR 24236, May 1, 1998]

Subpart E—Confidentiality of Statistics

§ 600.405 Types of statistics covered.

NOAA is authorized under the Magnuson-Stevens Act and other statutes to collect proprietary or confidential commercial or financial information. This part applies to all pertinent data required to be submitted to the Secretary with respect to any FMP including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing occurred, time of fishing, number of hauls, and the estimated processing capacity of, and the actual processing capacity utilized by, U.S. fish processors.

[61 FR 32540, June 24, 1996, as amended at 63 FR 7075, Feb. 12, 1998]

§ 600.410 Collection and maintenance of statistics.

(a) *General.* (1) All statistics required to be submitted to the Secretary are provided to the Assistant Administrator.

(2) After receipt, the Assistant Administrator will remove all identifying particulars from the statistics if doing so is consistent with the needs of NMFS and good scientific practice.

(3) Appropriate safeguards as specified by NOAA Directives, or other NOAA or NMFS internal procedures, apply to the collection and maintenance

of all statistics, whether separated from identifying particulars or not, so as to ensure their confidentiality.

(b) *Collection agreements with states.*

(1) The Assistant Administrator may enter into an agreement with a state authorizing the state to collect statistics on behalf of the Secretary.

(2) NMFS will not enter into a cooperative collection agreement with a state unless the state has authority to protect the statistics from disclosure in a manner at least as protective as these regulations.

§ 600.415 Access to statistics.

(a) *General.* In determining whether to grant a request for access to confidential data, the following information will be taken into consideration (also see § 600.130):

(1) The specific types of data required.

(2) The relevance of the data to conservation and management issues.

(3) The duration of time access will be required: continuous, infrequent, or one-time.

(4) An explanation of why the availability of aggregate or non-confidential summaries of data from other sources would not satisfy the requested needs.

(b) *Federal employees.* Statistics submitted as a requirement of an FMP and that reveal the identity of the submitter will only be accessible to the following:

(1) Personnel within NMFS responsible for the collection, processing, and storage of the statistics.

(2) Federal employees who are responsible for FMP development, monitoring, and enforcement.

(3) Personnel within NMFS performing research that requires confidential statistics.

(4) Other NOAA personnel on a demonstrable need-to-know basis.

(5) NOAA/NMFS contractors or grantees who require access to confidential statistics to perform functions authorized by a Federal contract or grant.

(c) *State personnel.* Upon written request, confidential statistics will only be accessible if:

(1) State employees demonstrate a need for confidential statistics for use

Magnuson-Stevens Fishery Conservation and Management Act

Public Law 94-265

As amended through October 11, 1996

SEC. 303. CONTENTS OF FISHERY MANAGEMENT PLANS 16 U.S.C. 1853

95-354, 99-659, 101-627, 104-297

(a) REQUIRED PROVISIONS.--Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery, shall--

(1) contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States, which are--

(A) necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery;

(B) described in this subsection or subsection (b), or both; and

(C) consistent with the national standards, the other provisions of this Act, regulations implementing recommendations by international organizations in which the United States participates (including but not limited to closed areas, quotas, and size limits), and any other applicable law;

(2) contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interest in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any;

(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification;

(4) assess and specify--

(A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3),

(B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing, and

(C) the capacity and extent to which United States fish processors, on an annual basis, will process that portion of such optimum yield that will be harvested by fishing vessels of the United States;

(5) specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, and charter fishing in the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls, and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors;

(6) consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safe conduct of the fishery; except that the adjustment shall not adversely affect conservation efforts in other fisheries or discriminate among participants in the affected fishery;

(7) describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 305(b)(1)(A), minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat;

(8) in the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) (including any plan for which an amendment is submitted to the Secretary for such review) or is prepared by the Secretary, assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;

(9) include a fishery impact statement for the plan or amendment (in the case of a plan or amendment thereto submitted to or prepared by the Secretary after October 1, 1990) which shall assess, specify, and describe the likely effects, if any, of the conservation and management measures on--

(A) participants in the fisheries and fishing communities affected by the plan or amendment; and

(B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants;

(10) specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished, contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery;

(11) establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority--

(A) minimize bycatch; and

(B) minimize the mortality of bycatch which cannot be avoided;

(12) assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish, and include conservation and management measures that, to the extent practicable, minimize mortality and ensure the extended survival of such fish;

(13) include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery and, to the extent practicable, quantify trends in landings of the managed fishery resource by the commercial, recreational, and charter fishing sectors; and

(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.

97-453, 99-659, 101-627, 102-251, 104-297

(b) DISCRETIONARY PROVISIONS.--Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery, may--

(1) require a permit to be obtained from, and fees to be paid to, the Secretary, with respect to--

(A) any fishing vessel of the United States fishing, or wishing to fish, in the exclusive economic zone [or special areas,]* or for anadromous species or Continental Shelf fishery resources beyond such zone [or areas]*;

(B) the operator of any such vessel; or

(C) any United States fish processor who first receives fish that are subject to the plan;

(2) designate zones where, and periods when, fishing shall be limited, or shall not be permitted, or shall be permitted only by specified types of fishing vessels or with specified types and quantities of fishing gear;

(3) establish specified limitations which are necessary and appropriate for the conservation and management of the fishery on the--

(A) catch of fish (based on area, species, size, number, weight, sex, bycatch, total biomass, or other factors);

(B) sale of fish caught during commercial, recreational, or charter fishing, consistent with any applicable Federal and State safety and quality requirements; and

(C) transshipment or transportation of fish or fish products under permits issued pursuant to section 204;

(4) prohibit, limit, condition, or require the use of specified types and quantities of fishing gear, fishing vessels, or equipment for such vessels, including devices which may be required to facilitate enforcement of the provisions of this Act;

(5) incorporate (consistent with the national standards, the other provisions of this Act, and any other applicable law) the relevant fishery conservation and management measures of the coastal States nearest to the fishery;

(6) establish a limited access system for the fishery in order to achieve optimum yield if, in developing such system, the Council and the Secretary take into account--

- (A) present participation in the fishery,
- (B) historical fishing practices in, and dependence on, the fishery,
- (C) the economics of the fishery,
- (D) the capability of fishing vessels used in the fishery to engage in other fisheries,
- (E) the cultural and social framework relevant to the fishery and any affected fishing communities, and
- (F) any other relevant considerations;

(7) require fish processors who first receive fish that are subject to the plan to submit data (other than economic data) which are necessary for the conservation and management of the fishery;

(8) require that one or more observers be carried on board a vessel of the United States engaged in fishing for species that are subject to the plan, for the purpose of collecting data necessary for the conservation and management of the fishery; except that such a vessel shall not be required to carry an observer on board if the facilities of the vessel for the quartering of an observer, or for carrying out observer functions, are so inadequate or unsafe that the health or safety of the observer or the safe operation of the vessel would be jeopardized;

(9) assess and specify the effect which the conservation and management measures of the plan will have on the stocks of naturally spawning anadromous fish in the region;

(10) include, consistent with the other provisions of this Act, conservation and management measures that provide harvest incentives for participants within each gear group to employ fishing practices that result in lower levels of bycatch or in lower levels of the mortality of bycatch;

(11) reserve a portion of the allowable biological catch of the fishery for use in scientific research; and

(12) prescribe such other measures, requirements, or conditions and restrictions as are determined to be necessary and appropriate for the conservation and management of the fishery.

97-453, 104-297

(c) PROPOSED REGULATIONS.--Proposed regulations which the Council deems necessary or appropriate for the purposes of--

(1) implementing a fishery management plan or plan amendment shall be submitted to the Secretary simultaneously with the plan or amendment under section 304; and

(2) making modifications to regulations implementing a fishery management plan or plan amendment may be submitted to the Secretary at any time after the plan or amendment is approved under section 304.

make no changes to Tung Mung's margin of 21.10 percent for the final results.

Sales Below Cost

We disregarded sales below cost for both YUSCO and Chia Far during the course of the review.

Changes Since the Preliminary Results

Based on our analysis of comments received, we have made changes in the margin calculations for Chia Far. The changes to the margin calculations are listed below:

1. We included all of the depreciation expense incurred in the common service department at Pu-Shin and allocated it to the rolling department in the calculation of the cost of production.
2. We used Chia Far's 2001 financial statements to calculate the net interest expense ratio and G&A expense ratio. We also included miscellaneous losses in the G&A expense ratio.
3. We used Chia Far's reported inventory carrying costs incurred in Taiwan.

Final Results of Review

We determine that the following percentage margin exists for the period July 1, 2000 through June 30, 2001:

STAINLESS STEEL SHEET AND STRIP IN COILS FROM TAIWAN

Manufacturer/exporter/reseller	Margin (percent)
YUSCO	0.0
Chia Far	1.11
Tung Mung	21.10

The Department will determine, and the Customs Service shall assess, antidumping duties on all appropriate entries. In accordance with 19 CFR 351.212(b)(1), we have calculated an exporter/importer (or customer)-specific assessment rate for merchandise subject to this review. The Department will issue appropriate assessment instructions directly to the Customs Service within 15 days of publication of these final results of review. We will direct the Customs Service to assess the resulting assessment rates against the entered customs values for the subject merchandise on each of the importer's/customer's entries during the review period. For duty-assessment purposes, we will calculate importer-specific assessment rates by dividing the dumping margins calculated for each importer by the total entered value of sales for each importer during the period of review.

Cash Deposit Requirements

The following deposit requirements will be effective upon publication of this notice of final results of administrative review for all shipments of stainless steel sheet and strip in coils from Taiwan entered, or withdrawn from warehouse, for consumption on or after the date of publication, as provided by section 751(a)(1) of the Act: (1) The cash deposit rates for YUSCO, Chia Far and Tung Mung will be the rates shown above; (2) for previously reviewed or investigated companies not listed above, the cash deposit rate will continue to be the company-specific rate published for the most recent period; (3) if the exporter is not a firm covered in this review, a prior review, or the original less-than-fair-value (LTFV) investigation, but the manufacturer is, the cash deposit rate will be the rate established for the most recent period for the manufacturer of the merchandise; and (4) if neither the exporter nor the manufacturer is a firm covered in these or any previous reviews conducted by the Department, the cash deposit rate will be the "all others" rate, which is 12.12 percent.

These deposit requirements shall remain in effect until publication of the final results of the next administrative review.

Notification of Interested Parties

This notice also serves as a final reminder to importers of their responsibility under 19 CFR 351.402(f)(2) to file a certificate regarding the reimbursement of antidumping duties or countervailing duties prior to liquidation of the relevant entries during this review period. Failure to comply with this requirement could result in the Secretary's presumption that reimbursement of the antidumping duties or countervailing duties occurred and the subsequent assessment of double antidumping duties or countervailing duties.

This notice also serves as a reminder to parties subject to administrative protective orders ("APOs") of their responsibility concerning the return or destruction of proprietary information disclosed under APO in accordance with 19 CFR 351.305, which continues to govern business proprietary information in this segment of the proceeding. Timely written notification of the return/destruction of APO materials or conversion to judicial protective order is hereby requested. Failure to comply with the regulations and terms of an APO is a violation which is subject to sanction.

We are issuing and publishing this determination and notice in accordance with sections 751(a)(1) and 771(i) of the Act.

Dated: December 6, 2002.

Faryar Shirzad,
Assistant Secretary for Import Administration.

APPENDIX 1 -- ISSUES IN THE DECISION MEMORANDUM

Issues with Respect to Tung Mung and Ta Chen

Comment 1: Total Adverse Facts Available ("AFA") for Tung Mung and Ta Chen

Comment 2: Whether Ta Chen Should Be Granted a Partial Recision of Review

Issues with Respect to YUSCO

Comment 3: Sales to Affiliated Parties in the United States

Comment 4: Affiliation With China Steel

Comment 5: Classification of Home Market Sales

Comment 6: The Use of AFA

Issues with Respect to Chia Far

Comment 7: Total AFA

Comment 8: Affiliated-Party Purchases

Comment 9: General and Administrative ("G&A") Expenses

Comment 10: Appropriate Period for G&A and Interest Expense Ratios

Comment 11: Inventory Carrying Costs Incurred in Taiwan for U.S. Sales

Comment 12: Constructed Export Price ("CEP") Transactions

[FR Doc. 02-31481 Filed 12-12-02; 8:45 am]

BILLING CODE 3510-DS-S

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[I.D. 120902C]

Proposed Information Collection; Comment Request; Gulf of Mexico Shrimp Economic Data Collection

AGENCY: National Oceanic and Atmospheric Administration (NOAA).

ACTION: Notice.

SUMMARY: The Department of Commerce, as part of its continuing effort to reduce paperwork and respondent burden, invites the general public and other Federal agencies to take this opportunity to comment on proposed and/or continuing information collections, as required by the Paperwork Reduction Act of 1995, Public Law 104-13 (44 U.S.C. 3506(c)(2)(A)).

DATES: Written comments must be submitted on or before February 11, 2003.

ADDRESSES: Direct all written comments to Diana Hynek, Departmental Paperwork Clearance Officer, Department of Commerce, Room 6625, 14th and Constitution Avenue, NW, Washington, DC 20230 (or via the Internet at dHynek@doc.gov).

FOR FURTHER INFORMATION CONTACT: Requests for additional information or copies of the information collection instrument and instructions should be directed to Michael Travis, Department of Commerce, NOAA, National Marine Fisheries Service, 9721 Executive Center Drive North, St. Petersburg, FL 33702-2439, (727)570-5335.

SUPPLEMENTARY INFORMATION:

I. Abstract

NMFS proposes to collect information on fishing vessel expenses and earnings on a voluntary and continuous basis in the Gulf of Mexico offshore shrimp fishery in order to conduct socioeconomic analyses that will: improve fishery management making in that fishery; satisfy NMFS' legal mandates under Executive Order 12866, the Magnuson-Stevens Fishery Conservation and Management Act (U.S.C. 1801 et. seq.), the Regulatory Flexibility Act, the Endangered Species Act, and the National Environmental Policy Act; and quantify achievement of the performance measures in the NMFS Strategic Operating Plans. Used in conjunction with catch and effort data already being collected in this fishery as part of its dealer reporting program, as well as Coast Guard and fishing permit data on vessel characteristics, this data will be used to assess how fishermen will be impacted by and respond to any regulation likely to be considered by fishery managers. In addition, this data will be used to determine how fishing communities will be impacted by proposed fishing regulations. In the program's first year, the program will only cover vessels that primarily port in the state of Texas, with vessels from the other Gulf States being included in the second year.

II. Method of Collection

Data will be collected using personal interviews and a formal survey instrument. Compared to phone interviews and mail surveys, personal interviews have been shown to generally produce higher response rates and higher quality data. Interviews will be conducted once each year in regards to the previous year's activities. Vessel owners will be asked questions

pertaining to the variable costs of their fishing operations, such as price and amount of fuel used, price and amount of ice used, groceries, processing/selling fees, and labor costs. Vessel owners will also be asked questions regarding their vessel's annual or fixed costs, such as expenditures for vessel repair and maintenance, gear repair and maintenance, fishing licenses and permits, insurance, dock fees, repayment on boat and business loans, office expenses and so forth. Vessel owners will also be asked questions pertaining to the capital investment in their vessels, such as purchase price, cost of subsequent investments in the vessel and its fishing technology, and current market or replacement value. Finally, vessel owners will be asked questions regarding their socio-demographic status, such as household size, income, dependence on fishing, alternative employment opportunities, level of fishing experience, age, education level, ethnicity/race, marital status, and so forth. In instances where vessels are not operated by the owner, socio-demographic data will be solicited from both the owner and captain. Though unknown at this time, it is assumed that nearly 50 percent of these vessels are operated by hired captains.

III. Data

OMB Number: None.

Form Number: None.

Type of Review: Regular submission.

Affected Public: Business or other for-profit organizations (vessel owners and captains).

Estimated Number of Respondents: 185.

Estimated Time Per Response: 20 minutes for variable cost and price questions; 30 minutes for annual/fixed cost and capital investment questions; and 10 minutes for socio-demographic questions.

Estimated Total Annual Burden Hours: 135.

Estimated Total Annual Cost to Public: \$0.

IV. Request for Comments

Comments are invited on: (a) whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information shall have practical utility; (b) the accuracy of the agency's estimate of the burden (including hours and cost) of the proposed collection of information; (c) ways to enhance the quality, utility, and clarity of the information to be collected; and (d) ways to minimize the burden of the collection of information on respondents, including through the

use of automated collection techniques or other forms of information technology.

Comments submitted in response to this notice will be summarized and/or included in the request for OMB approval of this information collection; they also will become a matter of public record.

Dated: December 6, 2002.

Gwellnar Banks,

Management Analyst, Office of the Chief Information Officer.

[FR Doc. 02-31448 Filed 12-12-02; 8:45 am]

BILLING CODE 3510-22-S

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[I.D. 120902D]

Proposed Information Collection; Comment Request; Pacific Billfish Angler Survey

AGENCY: National Oceanic and Atmospheric Administration (NOAA).

ACTION: Notice.

SUMMARY: The Department of Commerce, as part of its continuing effort to reduce paperwork and respondent burden, invites the general public and other Federal agencies to take this opportunity to comment on proposed and/or continuing information collections, as required by the Paperwork Reduction Act of 1995, Public Law 104-13 (44 U.S.C. 3506(c)(2)(A)).

DATES: Written comments must be submitted on or before February 11, 2003.

ADDRESSES: Direct all written comments to Diana Hynek, Departmental Paperwork Clearance Officer, Department of Commerce, Room 6625, 14th and Constitution Avenue, NW, Washington, DC 20230 (or via the Internet at dHynek@doc.gov).

FOR FURTHER INFORMATION CONTACT:

Requests for additional information or copies of the information collection instrument and instructions should be directed to David Holts, Southwest Fishery Science Center, 8604 La Jolla Shores Drive, P.O. Box 271, La Jolla, CA 92038-0271 (phone 858-546-7186).

SUPPLEMENTARY INFORMATION:

I. Abstract

The National Oceanic and Atmospheric Administration's Southwest Fishery Science Center operates a billfish resource and